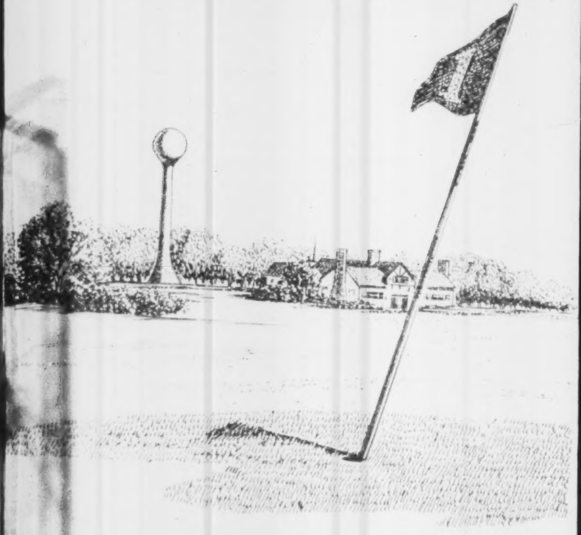
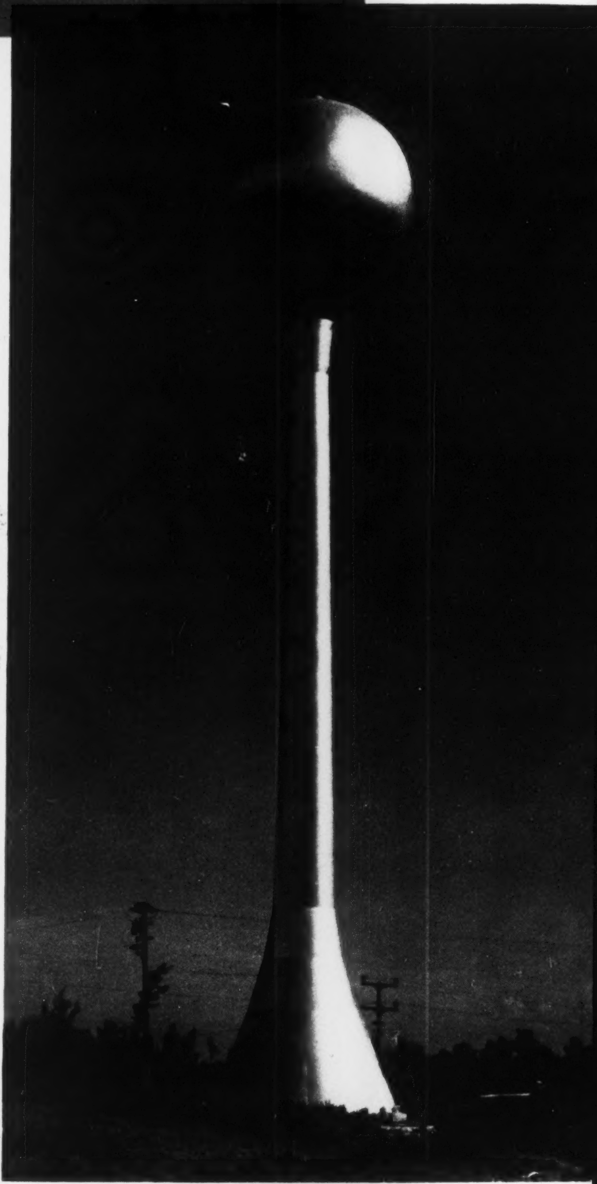
ENGINEERING NEWS-RECORD

A McGRAW-HILL PUBLICATION

THE WATERSPHERE

what could be more appropriate . . . or more efficient?





An increasing number of golf clubs throughout the country are discovering that a Horton Watersphere ideally answers the problem of dependable, more attractive water storage. Its striking resemblance to a "ball and tee" is the result of a design that is both completely appropriate and functionally efficient.

Recently the exclusive Seminole Golf Club in East Palm Beach, Florida installed a 60,000-gallon Watersphere to provide water for the club house, the course, and also the nearby community of Juno Beach. It is not only pleasing in appearance but structurally sound—designed for winds up to 150 mph.

Consider a Watersphere whenever you are drawing up plans for a club, factory, or school—wherever efficient water service is desirable. Standard capacities range from 25,000 to 250,000 gallons.

Write our nearest office for full information.

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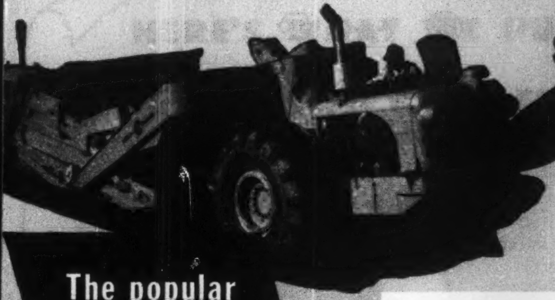
Plants in BIRMINGHAM, CHICAGO, SALT LAKE CITY, and Greenville

In Canada: HORTON STEEL WORKS, Limited, FORT ERIE, Ont

The great line of LaPLANT-CHOATE *Earthmovers*



The popular MOTOR SCRAPERS

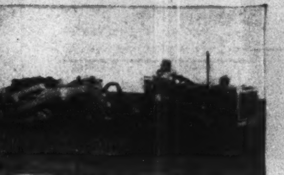
TS-300 MOTOR SCRAPER
WHEN your job calls for moving big volumes, you can bank on the high production features of the big TS-300 Motor Scraper. Big capacity . . . 14-cu. yds. struck and 17.5-cu. yds. heaped. Speeds in excess of 22 mph. Easy loading and positive forced ejection cut seconds off the operating cycle. Big power . . . with your choice of two Diesel engines—Buda 6-DAS 844 at 280 HP, or Cummins NHS-600 at 275 HP. Investigate *all* the profit-making features of the TS-300 today!

TW-300 MOTOR WAGON
HERE'S a hydraulically controlled bottom dump wagon flexibly joined to the same tractor used on the TS-300 Motor Scraper. 14- to 19-cu. yd. capacity, high speed and rugged power, plus many other money-saving features make this an outstanding unit.

TS-200 MOTOR SCRAPERS
The TS-200 is a 9- to 12-yd. hydraulically controlled earthmover small enough for small yardage jobs, yet with all the capacity, power and speed necessary for high production on your long haul jobs.

LaPLANT-CHOATE CABLE and HYDRAULIC SCRAPERS

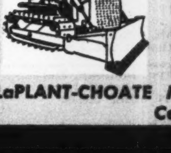
C-314 CABLE SCRAPER
FOR short hauls with track type tractors, you can't beat the performance of C-314 Cable Scrapers. 14-cu. yd. capacity struck, 17.5-cu. yd. heaped. Designed for use with tractors of more than 110 HP. Easily converted for use with T-300 Tractor to become high-speed TS-300 Motor Scraper.



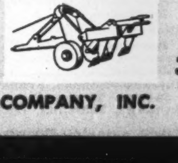
4-YD. HYDRAULIC SCRAPER
FOR smaller jobs with either track type or industrial, rubber-tired tractors. Improved, single-unit hydraulic system provides direct and instantaneous control of bowl and ejector, plus down pressure on the cutting edge when needed. 4-yd. or 2-yd. sizes available.

C-108 and C-106 CABLE SCRAPERS
The C-108 is an 8.4- to 11-cu. yd. scraper for use with tractors of 75 to 110 HP. The C-106 has capacities from 6.1- to 7.5-cu. yds. and is ideal for use with 55 to 75 HP tractors. Both scrapers have the same outstanding performance characteristics as the larger C-314.

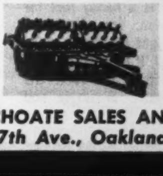
There is a size and type of LaPlant-Choate Scraper for every earthmoving job — see your LPC distributor today.



LaPlant-Choate DOZERS
Famous LPC Dozers, both angling and straight blade, are available in hydraulic types in D2, D4, D6, D7 and D8 sizes, or in cable-operated types in D7 and D8 sizes.



LaPlant-Choate RIPPERS
The Model RP-82 heavy-duty three-tooth ripper for use with large size tractors.



LaPlant-Choate TAMPERS
LPC Tampers are available in two popular sizes — the DSR 224 double drum and the TSR 336 full oscillating triple drum,

LaPLANT-CHOATE MANUFACTURING COMPANY, INC.
Cedar Rapids, Iowa

LaPLANT-CHOATE SALES AND SERVICE
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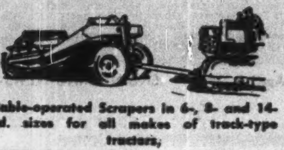
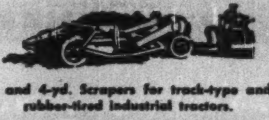
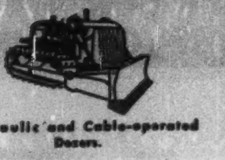


Cable-operated Scrapers in 6-, 8- and 14-yd. sizes for all makes of track-type tractors,



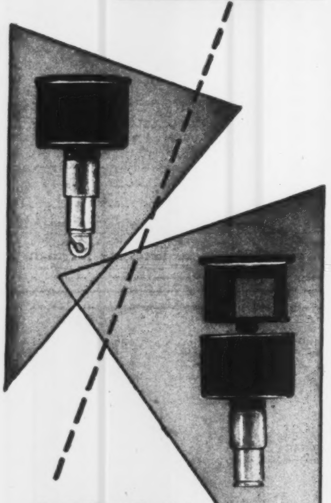
2- and 4-yd. Scrapers for track-type and rubber-tired industrial tractors.



Hydraulic and Cable-operated Dozers.

For your WATCH CHAIN

WILD
HEERBRUGG



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Pentagonal Prisms or Optical Squares the size of a plumb bob and the weight of a jack knife can be kept on your watch chain.

The Optical Square is a handy tool for checking on location, for alignment, and for laying out right angles. Speedily used as a hand level, it has an accuracy in leveling of 1 inch in 200 feet. The instrument is available in single and double prisms.

For further detailed information on the operation and use of Optical Squares call or write for Bklt NR 322.

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ENGINEERING NEWS-RECORD

ABP Member ABC

Volume 146 APRIL 5, 1951 No. 14

WALDO G. BOWMAN
Editor

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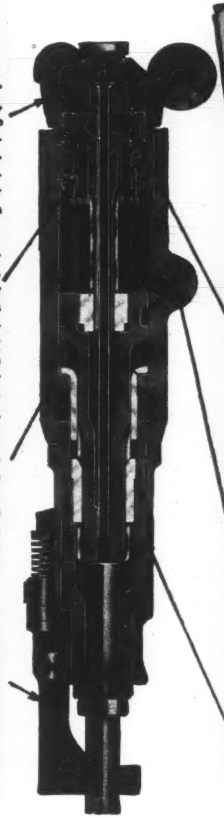
HERE'S WHAT WE PUT *INTO* A ROCK DRILL ...SO YOU CAN GET MORE *OUT* OF IT!

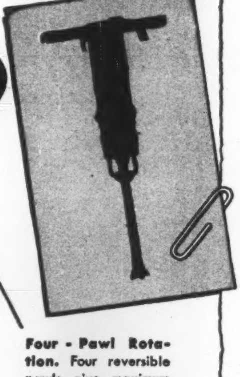


Combination Backhead for blast rod, air tube or water tube operation greatly reduces cost of change-over parts. Air-operated automatic water valve is optional on same backhead.

Jet Valve is instantaneous, positive-acting, end-seating. Thrown by a jet of air, it provides precise timing. Increased piston hammer velocity results in high drilling speed, low air consumption, strong rotation and easy holding.

Integral Cylinder. All hammer bores are ground in line at one operation, allowing piston hammer to run in true alignment. Replaceable bronze cylinder bushing maintains the front cushion.

Resilient Retainer. Yoke-type, held in replaceable hardened steel bushings and spring-cushioned to dampen vibrations when pulling drill rods. Easily opened and closed, can't wear the chuck housing, and has positive lock-on nuts.



Four-Pawl Rotation. Four reversible pawls give maximum service at four rotation speeds — extra fast, fast, slow, extra slow.

Independent Blow Control changes from drill to blow with ease. Full line pressure available for emergency blowing. Large diameter air tube assures strong, constant blow. Side outlet exhaust is possible with optional blow valve.

Three-Piece Chuck. Chuck, sleeve and nut. Replaceable bronze chuck nut held in a steel sleeve checks piston flute wear.

Worthington BLUE BRUTES

Have Everything You Need For Hard, Fast, Money-Saving Drilling

With every detail designed to make air do more work, Blue Brute Rock Drills combine the ruggedest construction with the easy handling that goes over big with operators. The WS-55, illustrated, is right for average jobs. For lighter work, use the WS-45 — for heavy duty, the WS-30.

3 More Reasons Why There's More Worth In A BLUE BRUTE*!*

WB-34 Paving Breaker
Hardest-hitting, easiest handling breaker in the 35-lb. class. Ideal where the operator has to lift the tool frequently in guiding its work.

W-14 Clay Digger
Developed in the field by men with practical experience in clay, and thoroughly proved by long, rigorous job-testing.

W-8 Backfill Tamper
Medium weight, with simple horse-shoe valve and ample oil reservoir. A good "walker" that does a finished backfill job, ready for immediate paving.

Immediate deliveries from your nearby Worthington Distributor
See him, or write us direct

BUY WORTHINGTON BLUE BRUTES

Worthington Pump and Machinery Corporation
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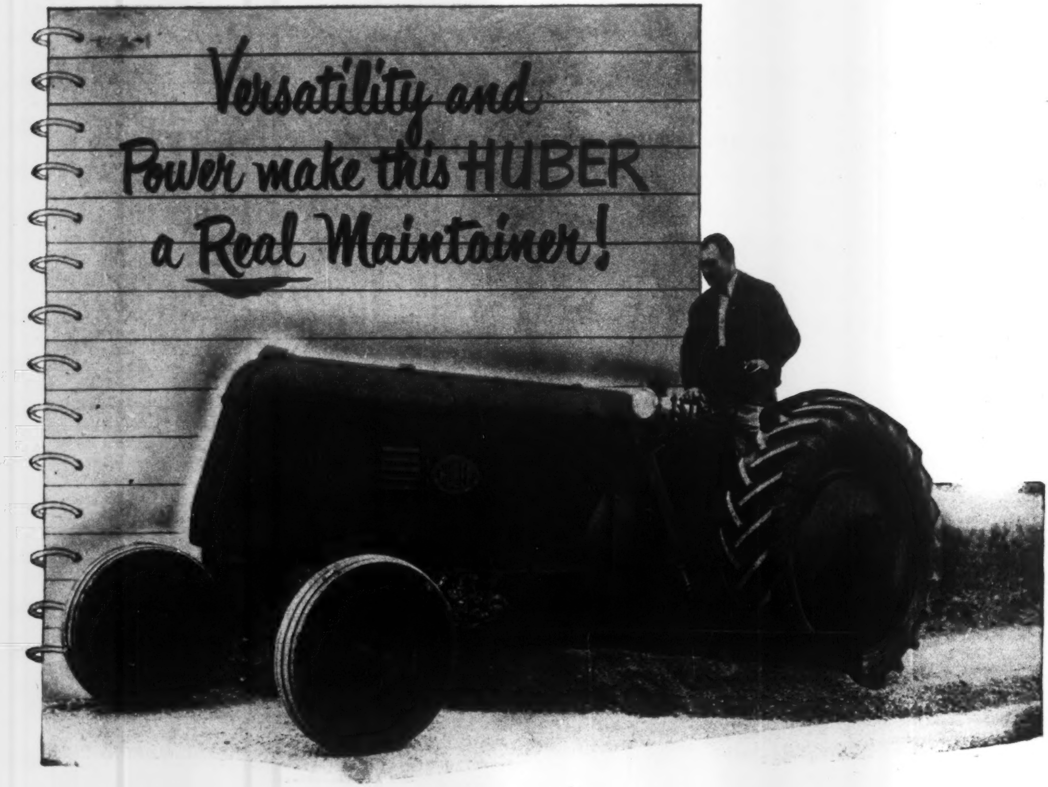
H8-9

IF IT'S A CONSTRUCTION JOB, IT'S A BLUE BRUTE JOB



Look at its versatility! Hydraulically controlled attachments quickly and easily convert it to bulldozer, lift loader, highway mower, berm grader, broom, road planer, patch roller or snow plow service.

Look at its power! . . . . 42½ H. P.

Other important advantages: 1—The blade is PUSHED by Huber's exclusive modified A-frame design. Power is transmitted to the moldboard DIRECTLY from the driving wheels. The result: better traction, less power loss and more efficient use of the machine's 6000-pound weight.

2—The HUBER Maintainer gives you maximum work results and versatility in a single, one-man machine at modest investment and operating costs.

Get more for your maintenance dollars—your nearest HUBER Distributor will show you how.

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to better performance and lower costs in the operation of industrial engines!

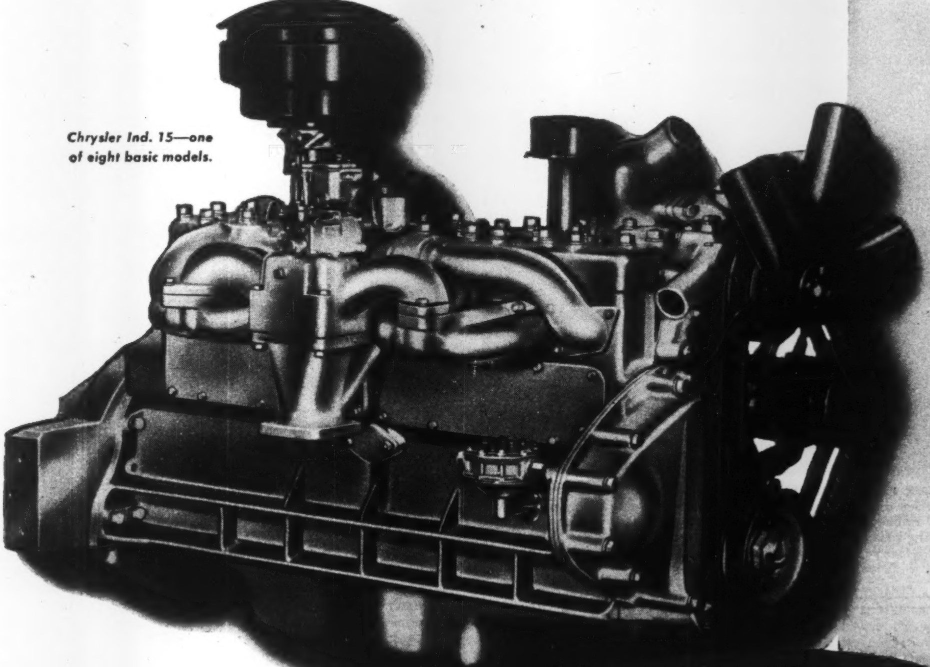
It's higher speeds! Pioneered by Chrysler. Perfected by Chrysler.

Today equipment manufacturers and users alike know you can have all the advantages of higher speed engines—*and lower costs, too.*

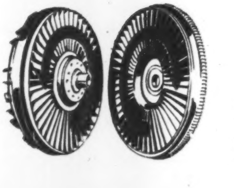
Famed Chrysler engineering and exhaustive research in higher alloy steels have produced a high speed engine that not only develops more power, more economically, but also costs *less* to operate and *less* to buy.

Chrysler Industrial Engines are at present helping to lower costs in over 50 different types of applications. A letter of inquiry will bring an engineer well qualified to discuss your requirements. Address

INDUSTRIAL ENGINE DIVISION, CHRYSLER CORPORATION, DETROIT 31, MICHIGAN



Chrysler Ind. 15—one of eight basic models.



CHRYSLER Gýrol FLUID DRIVE

Reduces Load Shock—Prevents Stalling!

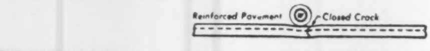
Get longer, more trouble-free service from your equipment! Get smoother, faster, easier operation! Put a safety cushion of oil between power and load! Available on all models.

CHRYSLER

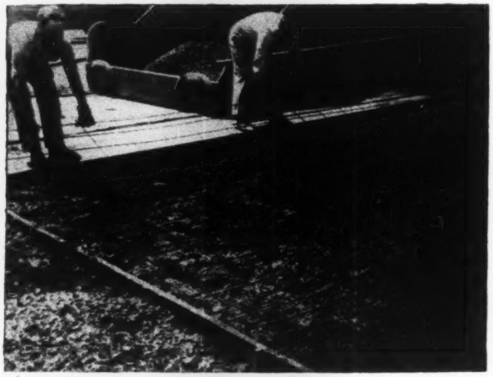
Saving Lives—Time—Money on

ON NEW YORK'S WEST SIDE HIGHWAY American Welded Wire Fabric helps to improve the riding comfort, and Multisafty Cable Guard provides maximum driving safety for the motoring public. American Welded Wire Fabric fortifies the ground slab in all directions, reduces the rate of cracking, prevents progressive damage and insures additional years of trouble-free service. Multisafty Cable Guard provides maximum safety at low maintenance cost.

LONGER PAVING SLABS, fewer expansion joints, improve riding qualities on concrete highways reinforced with American Welded Wire Fabric. Reduced rate of cracking, prevention of heaving and spalling also reduce maintenance costs, increase the service life of the highway.



AS THE WHEEL LOAD approaches an open crack in plain pavement, one slab end carries the entire load. As the wheel approaches the closed crack in pavement reinforced with American Welded Wire Fabric, both slab ends, instead of one, carry the load, preventing damage to the slab and to the subgrade.



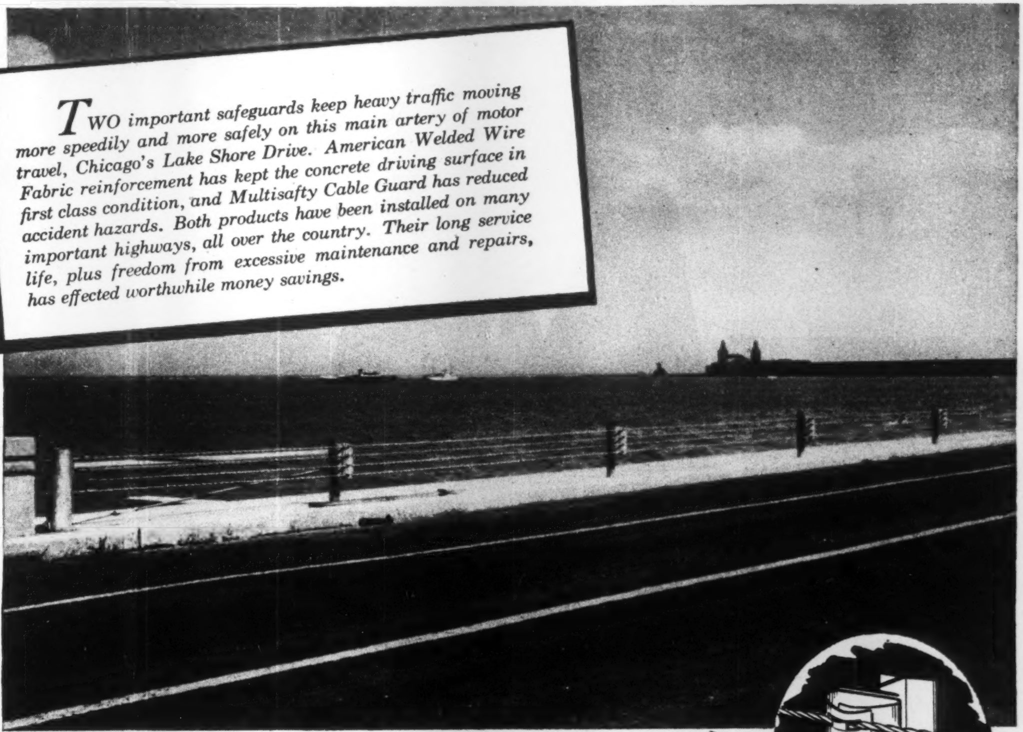
EASILY PUT IN PLACE, these big sheets lie flat, stay in place during pouring. The many small, closely-spaced members distribute the strength of high yield strength steel evenly throughout the slab. This fabric reinforcement makes possible longer slabs, fewer joints, hence smoother riding. Ease of handling and higher allowable stresses make for appreciable savings in labor and material costs. Long, economical service from roads in which it has been used is the main reason why American Welded Wire Fabric is the world's most widely-used prefabricated reinforcement for concrete highways.

USS

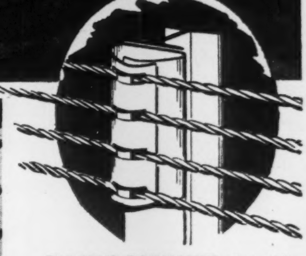
AMERICAN WELDED WIRE FABRIC —

UNITED STATES STEEL

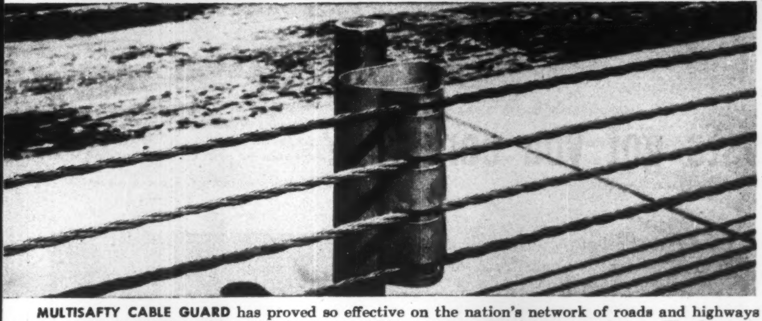
the Nation's Express Highways



TWO important safeguards keep heavy traffic moving more speedily and more safely on this main artery of motor travel, Chicago's Lake Shore Drive. American Welded Wire Fabric reinforcement has kept the concrete driving surface in first class condition, and Multisafty Cable Guard has reduced accident hazards. Both products have been installed on many important highways, all over the country. Their long service life, plus freedom from excessive maintenance and repairs, has effected worthwhile money savings.



THE FOUR GALVANIZED wire cables of Multisafty Cable Guard possess the tremendous strength needed to withstand terrific impact. The offset spring brackets on which the cables are mounted help to absorb impact stresses and to deflect vehicles which collide with the guard. Posts and anchorages are sufficiently sturdy to withstand the total stresses transmitted by cables and springs. No painting is required, therefore, upkeep costs are low.



MULTISAFTY CABLE GUARD has proved so effective on the nation's network of roads and highways that it has been adopted as a standard material by many state highway commissions. The four galvanized wire cables, attached to a galvanized resilient spring bracket, absorb the impact of collision and side swiping, prevent off-the-road crashes and capsizing of cars at high speeds. In addition to its long life and excellent performance in all climates at all seasons, Multisafty Cable Guard has established records for low installation and maintenance costs.

— and MULTISAFTY HIGHWAY GUARD

AMERICAN STEEL & WIRE COMPANY, GENERAL OFFICES: CLEVELAND, OHIO
COLUMBIA STEEL COMPANY, SAN FRANCISCO, PACIFIC COAST DISTRIBUTORS
TENNESSEE COAL, IRON & RAILROAD COMPANY, BIRMINGHAM, SOUTHERN DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

Costs got you cornered?

BROTHER, if operating costs have you backed into a corner these days, why not try selecting lubricants on the basis of long-run economy and performance.

You'll save. Yes, because—Quaker State HD Oil fights excessive wear . . . cuts maintenance costs . . . pares the fat off repair bills.

Quaker State HD Oil is refined with the most modern processing equipment. Made from 100% pure Pennsylvania grade crude oil, it is compounded with chemical detergents of highest quality.

No wonder shop-time is cut . . . and on-the-job time of every fleet unit is increased. This Quaker State HD Oil not only fights against friction wear and heat damage—but it helps to prevent the formation of sludge, gum and varnish—and actually cleans as it lubricates.

Start saving dollars now!

HD

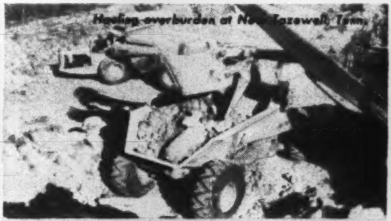
QUAKER STATE OIL REFINING CORPORATION, OIL CITY, PA.

9 reasons why TOURNAROCKERS cut haul costs

At Mt. Carmel, Pennsylvania, three 16-ton C Tournarockers haul 225 pay yards of clay, sand, and rock overburden hourly on 4200′ cycles for J. Robert Bazley, Inc.

Highway relocation [illegible]

1 ***Haul anywhere . . .*** Plenty of power with big tire traction takes fully-loaded Tournarocker up steep grades, over rough roads, soft fills where ordinary trucks can't go.



Hauling overburden at New Tazewell, Tenn.

2 ***Speed loading . . .*** Shovel operator has big, wide target with all Tournarockers. Body opening on 9-ton model is 7′ x 11′; on 16-ton, 8′ x 12½′; on 35-ton, 10′2″ x 16′10″.

Construction near Tecate, Mexico

3 ***Cut spotting delays . . .*** Short 90° turns and positive power steer by push-button controls quickly position rig under dipper. Multi-disc air brakes assure instant stops.

Road relocation at Wenatchee, Washington

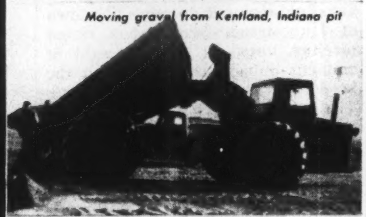
4 ***Work fast in tight quarters . . .*** power steer, 90° turns, electric controls, air brakes, speeds of 28 to 35 m.p.h., all contribute to fast haul over narrow, winding roads.

Dumping sandstone near New Haven, Conn.

5 ***Reduce time dumping . . .*** a touch of electric switch activates hoist motor. There's no delay for hydraulic pressure to build up. Loads fall free and FAST!

[illegible] work at Concrete, Washington

6 ***Cleans load every time . . .*** even in sticky clay, Tournarocker dumps clean. Streamlined body "rocks" quickly to vertical position. No material rides back to excavator.



Moving gravel from Kentland, Indiana pit

7 ***Save dump clean up . . .*** Front-wheel drive lets Tournarocker back to edge of fill, dump clear over bank. This eliminates dozer clean-up, provides continuous fast dump.

Hauling clay for Ohio cement plant

Tournarocker, Tournamatic—Trademark C147 b

8 ***Cut weather delays . . .*** haul even when crawlers can't. Giant tires increase flotation. Tournamatic differential applies 4 times the pull to wheel on firmest footing.

Stripping rock near Phoenix, Arizona

9 ***Reduce maintenance . . .*** because Tournarocker has no hydraulics, highpressure jack lines, or long driveshafts, common troubles of other rear-dumps are eliminated.

LETOURNEAU TOURNAROCKERS

PEORIA, ILLINOIS

HIGH SPEED on RUBBER PLUS TRACTION ADVANTAGES of a CRAWLER

GET ORDERS IN NOW

for low-cost Bantam

Saves on garbage disposal

Many cities report substantial savings in disposal costs with Bantam sanitary land-fill method. Mobile Bantam hoe or dragline opens suitable trench in a few hours . . . returns as needed to spread and compact fill over refuse.

Speeds sewer repairs

Truck-mounted Bantam easily handles 3 to 4 sewer or water line repairs per day, including breaking 20' to 30' lengths of pavement and digging down 10' to 12' to make the repair. Sewer Supts. report savings up to 75% over hand methods.

Cuts cost of materials handling

Versatile Bantam goes anywhere, anytime at speeds to 35 M.P.H. . . . keeps busy stock-piling sand, cinders, aggregate . . . loads trucks, hoppers, etc. . . . pours concrete . . . handles steel, pipe, slabs, etc. . . . has 6 fast-change attachments for year 'round use.

Clip... Mail today!

SB-MU-2

SCHIELD BANTAM CO., 201 Park St., Waverly, Iowa

Send details on truck-mounted Bantam

☐ Shovel ($6195)*
☐ Hoe ($6040)*
☐ Pile Driver ($6110)*
☐ Crane ($5520)*
☐ Dragline ($5940)*
☐ Clamshell ($6080)*

Name________ Title________
Company________
Address________
City________ State________

*Less boom, F.O.B. Waverly, Iowa. Prices subject to change without notice.

SCHIELD BANTAM

Costs less . . . goes anywhere fast
GETS MORE JOBS DONE

NEWS BRIEFS

Tax holiday—The town of Mount Pleasant, Westchester County, N. Y., has called off the general tax for 1951. The reason for this godsend to taxpayers, as explained by Supervisor Owen M. Quinn, is that Mount Pleasant has foreclosed on a number of properties which were in arrears on taxes and has made enough on the sale of the real estate to meet the year's budget. A state law permits such procedure when taxes are in arrears for four years or more. Some owners had owed taxes for almost 50 years. During the last two years the town has netted $270,000 from tax sales.

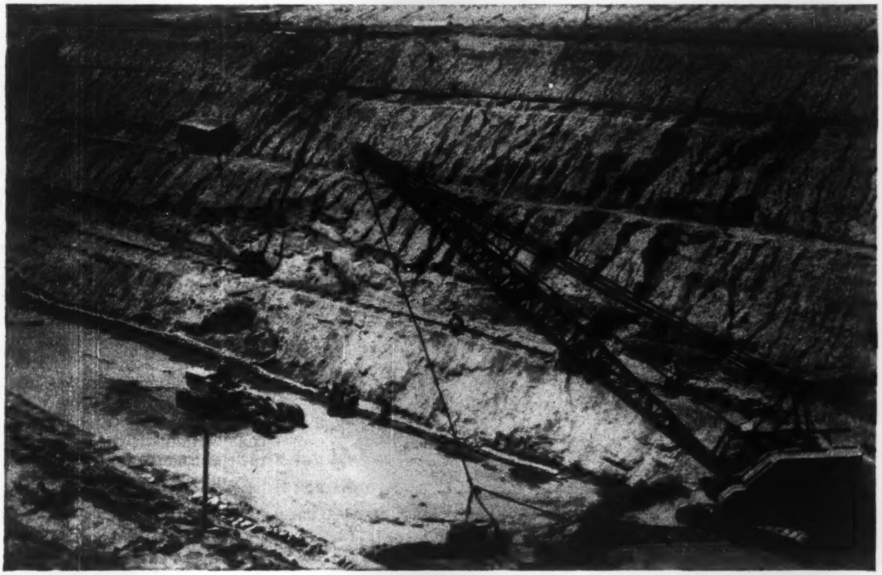
Interstate comity—It is reported that interstate truckers are loading up on gasoline in Missouri to escape the higher tax in Illinois. They fill their tanks in the St. Louis area and then drive all the way across Illinois without ever contributing anything to the upkeep of the Illinois roads they use. This is in violation of a state law which requires trucks entering Illinois to have no more than 20 gal. of fuel aboard. However, the law has not been enforced for six years because, according to the state motor fuel department, Illinois truckers do the same thing in Indiana.

Maybe experience is worth something—Gardner, Mass., has started to get rid of the smoke nuisance. Mayor Gabriel G. Morse recently announced that a survey of the problem will be made by a University of Massachusetts student on the basis of his thesis for a master's degree. The mayor said the cost to the city will be only about $200 for meals and transportation, compared with $2,000 it would cost to have a professional smoke engineer survey the situation.

Good old eminent domain—The town of Huntington, Mass., at a recent meeting, voted to seize by right of eminent domain land on which the town's water supply pumps are located. The owner of the property refused to sell because he preferred to get a lifetime rental from the town.

Earthquake resistance—William D. Shannon, Seattle civil engineer and state senator, has introduced into the Washington legislature a measure requiring the construction of earthquake-resistant buildings in areas subject to seismic disturbances. The measure would classify most of the Puget Sound area as a zone subject to major damage from that source.

WIRE ROPE



You'll have fewer shut-downs . . . cut replacement time with Roebling rope

YOU PAY FOR THE BEST when you buy wire rope. And you *get the best* when you buy Roebling Preformed "Blue Center" Steel Wire Rope. "Blue Center" steel is an exclusive Roebling product . . . gives rope the extra toughness that spells long life . . . service economy that really counts. Besides that, Roebling Preformed can be cut without seizing . . . always spools better . . . reduces vibration and whipping . . . doesn't tend to set or kink.

Roebling makes a wide range of wire rope . . . brings you the right construction, grade and size for top performance and economy on each installation. Have your Roebling Field Man help select the *best* rope for your particular requirements. And for maximum savings, get his suggestions on the proper use and maintenance of wire rope. He knows the case histories of thousands of installations. John A. Roebling's Sons Company, Trenton 2, New Jersey.

ROEBLING

Atlanta, 934 Avon Ave ★ ***Boston,*** 51 Sleeper St ★ ***Chicago,*** 5525 W. Roosevelt Rd ★ ***Cincinnati,*** 3253 Fredonia Ave ★ ***Cleveland,*** 701 St. Clair Ave, N.E. ★ ***Denver,*** 4801 Jackson St ★ ***Houston,*** 6216 Navigation Blvd ★ ***Los Angeles,*** 216 S. Alameda St ★ ***New York,*** 19 Rector St ★ ***Odessa, Texas,*** 1920 E. 2nd St ★ ***Philadelphia,*** 230 Vine St ★ ***San Francisco,*** 1740 17th St ★ ***Seattle,*** 900 1st Ave, S. ★ ***Tulsa,*** 321 N. Cheyenne St

For the smoothest shave on the face of the earth...
They Go Together
A-C

BAKER
Bulldozer and Gradebuilder Blades

Positive *hydraulic* action—that's the secret of the smooth performance that we build into every Baker Bulldozer and Gradebuilder. *Positive down-pressure* and *direct lift* are the twin features of this hydraulic action. Twin engine-mounted hydraulic cylinders (Baker was first, again, with engine-mounting) do the job in these new BAKER attachments for your new and more powerful ALLIS-CHALMERS Tractors. Write today for Bulletin 894.

...and if you want to pull 'em out by the roots ...BAKER ROOT RIPPER

THE BAKER MANUFACTURING COMPANY • SPRINGFIELD, ILLINOIS

BAKER

P.S.: Baker is the PIONEER and the SPECIALIST in bulldozers

Act of God—Back in 1916, before rainmaking had become a science, San Diego, Calif., contracted with Charles M. Hatfield to fill its almost empty reservoirs. After he had put up his towers, started some smoke, and muttered a few magic words it began to rain and kept on raining long after the reservoirs were running over. Flood damage took lives and ruined property. Hatfield fled town and never did collect his rain-making fee. Damage suits were filed, but courts decided it was an act of God, and therefore the city was not liable. Now, undeterred by that experience, San Diego has signed a two month contract with Rainfall Corporation of America, Pasadena, after which rainfall around the city's San Vincente and El Capitan watersheds was three times that at other county stations.

Freeway advantages—You don't deserve damages when freeway construction makes a deadend of your street—you've actually profited by getting a quieter and safer neighborhood. That's the decision of a Los Angeles superior court which denied four landowners the $12,250 damages they asked as a result of the new Hollywood Freeway. The landowners claimed that the new construction deprived them of access to the intersection, and prohibited easy ingress and egress to nearby main thoroughfares, but a jury held that the disadvantages were far outweighed by its advantages: enhanced value of adjoining property, better lighting, better air, and a better view.

The Cover

When the U. S. Atomic Energy Commission announced its plans for a $45,000,000 plant to be built in Colorado (see also p. 24), it turned over the job of building the installation to the capable hands of The Austin Company of Cleveland, and particularly to G. A. Bryant, Austin president, and W. R. Engstrom, vice-president.

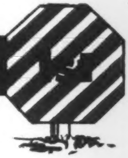
Working for AEC is no new thing to Austin, and particularly to Engstrom, who has headed construction of the AEC's Argonne Laboratories outside Chicago for the past several years. During the war he headed other Austin work for the government: Overseeing, for example, some $75,000,000 worth of construction for the Navy, including airfields and other facilities in the Pacific Northwest.

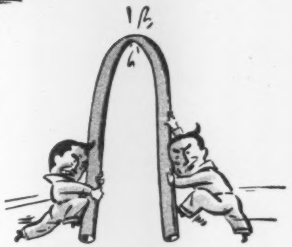
On the new job, Mr. Engstrom will be project manager for construction.

Mr. Bryant, an Austin executive since 1917, became president of the company in 1941, and was vice-president and general manager for eleven years before succeeding to the top office.

TIPS on TUBE USE

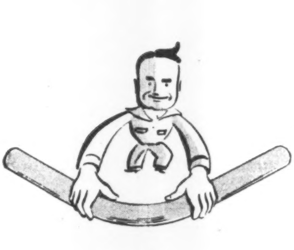
HOW TO BEND TUBE





. . . let us caution you not to bend tube with rapid motion. Such action usually kinks the tube. Don't sacrifice your time and tubing much less your reputation—for speed.

TO BEND TUBE PROPERLY



. . . grasp it in both hands with thumbs spaced about three inches apart, sliding the thumbs toward each other as you bend the tube. Repeat this until tubing assumes desired shape. A half dozen times—exerting an even pressure each time—is usually sufficient to bend a 3/8" tube. When bending a larger tube, start with hands farther apart and work the tubing to the required shape more slowly.

Choose good tube first—care makes it last.

WOLVERINE TUBE DIVISION
Calumet & Hecla Consolidated Copper Company
INCORPORATED
Manufacturers of seamless, non-ferrous tubing
1457 CENTRAL AVENUE • DETROIT 9, MICHIGAN
Plants in Detroit, Mich. and Decatur, Ala.

Buy From Your Wholesaler

Export Department, 13 E. 40th St., New York 16, N. Y.

KOEHRING

16-E

*twinbatch**

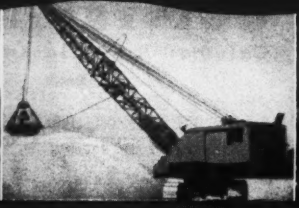
MOBILE • VERSATILE •

KOEHRING 16-E *twinbatch* provides many special operating advantages for intermediate paving and all types of concrete construction work: 60° elevating boom raises controlled-discharge bucket to a dumping height of 21 feet (higher with special boom) . . . gives complete flexibility of application for elevated pouring. 16-E *twinbatch* mixes and distributes up to 50 cu. yds. per hour, exceeding the capacity of the larger 27-E single drum paver. Big, 92-inch wide skip raises in only 7 seconds . . . split-second Autocycle mixing is controlled by Koehring Batchmeter, saves time on every phase of the operating cycle. As a result, the 16-E can hit a top output of 86.7 batches an hour, on 60-second mixing cycle specification. Vertical, syphon-type water tank assures consistent, maximum strength concrete . . . quarantees accuracy to meet all specifications.

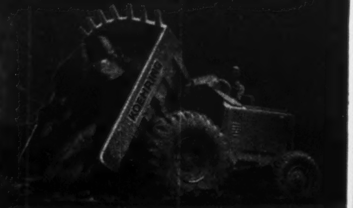
In addition, the 16-E *twinbatch* rides on 6 big 11:00 x 20 pneumatic tires . . . works, travels over pavement without surface damage. Drives job to job at speeds to 6 m.p.h. . . . cuts non-productive moving time, increases work time.

SAVE TIME, MONEY with COMPLETE KOEHRING HEAVY-DUTY LINE

34-E [illegible] PAVER . . . for big production on highways, airports and other extensive paving contracts. Ask, too, about Koehring Longitudinal Finisher for "Smooth", precision finishing.



[illegible] CRANES . . . draglines, shovels and hoes . . . available in 4 heavy-duty sizes: ½-yd., ¾-yd., 1½-yd., and the big 2½-yd.



HIGH-SPEED DUMPTOR* . . . with 6-yd. rock body, has 3 speeds forward and reverse for no-turn shuttle haul . . . 1-second gravity dump.

*Trademark Reg. U. S. Pat. Off. [illegible]

controlled ELEVATED DISCHARGE

FOR STREETS AND HIGHWAY WIDENING

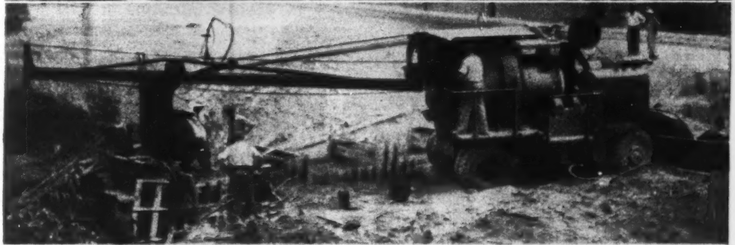
Rubber-tired mobility of 16-E *twinbatch* permits working over streets and new pavement strips without planking. Saves time on the job, and job-to-job. Has overall width of only 8 feet, plus speeds to 6 m.p.h., for fast, self-powered moves.

BRIDGES . . . .

You're not grounded with the 16-E . . . reaches up and out to discharge mixed concrete into forms, hoppers, chutes. Double-channel structural boom is 25 feet long . . . swings in a 160° arc . . . elevates 60° . . . holds firmly in any position . . . discharges controlled bucket at any height up to 21 feet.

CULVERTS . . .

For pouring culverts, and in other similar restricted areas, controlled door on bucket allows gradual discharge, prevents spillage. Clamshell-type bucket door can be opened or closed at any time, operates by hydraulic control. All operating mechanism is outside bucket, prevents clogging. Adjustable strap hangers and perfect oscillation assure vertical dumping position of bucket.



FOUNDATIONS . . .

On footings, pilings, retaining walls, etc., the 16-E *twinbatch* spots its load fast. Big bucket travels 92 feet per minute on elevated boom, 183 feet per minute on horizontal boom. 24 cu. ft. water level capacity of clamshell type bucket is more than ample for full 16 cu. ft. batch . . . plus 10% overload.

BATCHING CONCRETE

The high-production 16-E also can be set up as a central mix plant. Elevated pouring makes it handy for loading trucks, and for handling a variety of miscellaneous batching applications.

It will pay you to check all the other many advantages of this rubber-tired 16-E *twinbatch*. Write for new catalog . . . or call your local Koehring distributor for complete facts.

KOEHRING COMPANY

Mail to: KOEHRING COMPANY, Dept. ENR, Milwaukee 10, Wisconsin

Please send us new 8-page catalog on the rubber-tired 16-E Twinbatch.

NAME ____________________

COMPANY ____________________ TITLE ____________

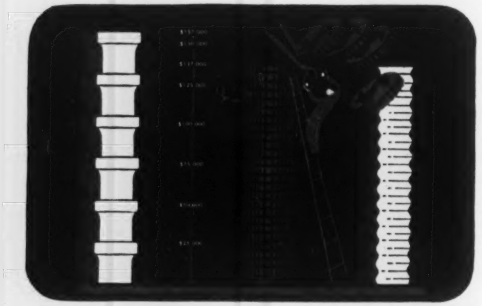
STREET ____________________

CITY ____________________

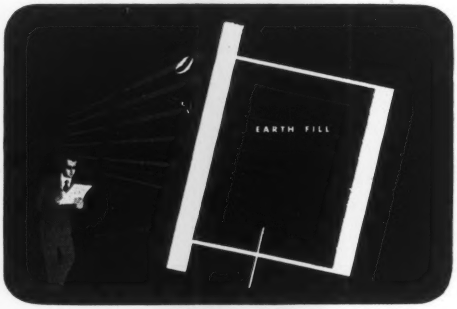
____________________ STATE ____________

How to profit with "low level bids"

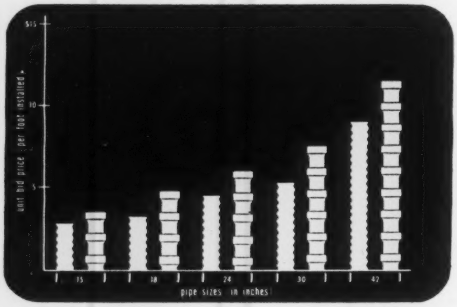
Experienced contractors bid to get the job and *retain adequate profits.* That is why so many practice "low level bidding" by considering the time and labor saving features of Armco Metal Structures. Here are four actual cases:



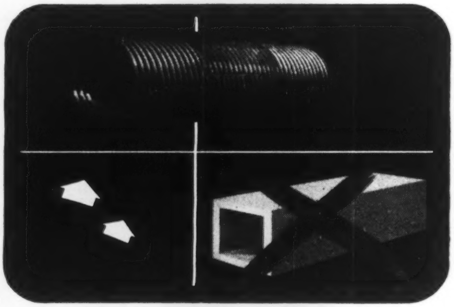
CASE I. The successful bidder on more than 22 miles of highway subdrainage for an eastern state figured the job two ways. First, he bid the job with short section, rigid pipe. Then by figuring an alternate bid using Armco Corrugated Metal Pipe he reduced his original estimate by more than $19,000.



CASE II. When a retaining wall was needed on a southeastern highway project the original plans called for monolithic design. The contractors bid price on the monolithic structure figured approximately $9.00 per square foot of facial area. By figuring the job with an Armco Bin-Type Wall the competitive and accepted bid was only $4.70 per square foot—almost 50% lower.



CASE III. Actual low bids on a midwestern drainage job show how experienced contractors bid Armco Corrugated Metal Pipe and short, sectional pipe on an installed basis. Averages for the total job indicate that it was considered necessary to bid 33.8% higher to install short, sectional pipe.



CASE IV. On drainage work for a southern highway the winning contractor was able to bid 26% lower for Armco MULTI-PLATE PIPE-ARCH than competing bids for a monolithic box structure.

Figured on an installed basis, Armco structures save money in many ways. Flexible, corrugated metal design assures ample strength without excess weight. There is no breakage, no curing, no waste, no delay. Handling is simplified—labor costs go down.

Use Armco Products on highways, railways, airports and wherever else you need economical, easy-to-install structures. Armco Drainage & Metal Products, Inc., 1901 Curtis Street, Middletown, Ohio. Export: The Armco International Corporation.

ARMCO METAL STRUCTURES

THE CONSTRUCTION WEEK

DEFENSE LETDOWN—Washington's attitude on mobilization has changed from frightened to phlegmatic. If congressmen found their constituents in a similar mood during the Easter recess, the change may become more pronounced. Mobilizers will still get the money for a 3,500,000-man armed force and for building up industrial capacity to war strength. But Congress may stall on taxes, controls and anti-inflation moves.

ROAD REPAIR LITTLE AFFECTED BY STEEL DIRECTIVE—The National Highway Users Conference believes that highway maintenance and repair programs will be affected only slightly, if at all, by a recent NPA order concerning the filling of DO-97 (MRO) steel orders. Government officials point out that virtually all steel products used in maintenance, repair and operation of highways are carried in supplier inventories and not specifically fabricated.

SNEAK PLAY—One way or another, Maryland manages to stay in the highway-overloading picture. Locale of last year's much-publicized highway loading tests (ENR Nov. 9, 1950, p. 30), the state allows single-axle weights of 22,400 lb—4,400 lb more than the limit considered essential to roadway longevity. Now, an impending Maryland law proposes to raise permissible gross loading for three-axle trucks by about 4,000 lb. The bill went quietly into the hopper just after defeat of a move to reduce the axle limit to 18,000 lb.

HIGHWAY ENGINEERS THREATEN—A state-wide "revolt" of some 300 registered engineers employed by the Indiana Highway Department over inadequate salary increases is disclosed by Sam Busby, executive secretary of the Indiana Society of Professional Engineers—of which about 75% are members. They say that the state has not carried out its promise to bring salaries in line with those paid highway engineers in the neighboring states of Michigan, Illinois, Kentucky and Ohio, and are planning their next move.

RESIDENTS BATTLE LOCAL FEDERAL HOUSING PLAN—In the Whitely area of Muncie, Ind., a petition is being circulated opposing the removal of signers from their homes to make way for a 350-unit, low-rent federal housing project. Petitioners say their present homes are modern and have sanitary plumbing. A survey firm selected the area as having the most sub-standard homes.

POINT AND COUNTERPOINT—Charles J. Bensley, chairman of the New York City Board of Education's committee on buildings and sites, last week announced plans in progress for a $10-million, 30-story school headquarters to serve as a model "world center of education." Board President Maximilian Moss criticized the proposal as an "immature suggestion", adding that there is an immediate need for 200 school buildings. Bensley countered that no funds would be diverted; revenues from the sale of highly-assessed properties could be utilized. The board will vote on it.

CRANE AND SHOVEL OUTLOOK—Tentative military needs—outlined by Defense Dept. officials—would require the entire capacity of the crane and shovel producers to fill DO orders for the rest of 1951. That it what the power crane and shovel Industry Advisory Committee was told at its first meeting with NPA's Machinery Division. But DO orders are taking only 10 to 20% of current production, held down by scarcity of materials to 7,000 units a year, as compared with 10,000 during War II.

Save Men...Money...Material *with* Concrete Joist Construction

In these days of critical shortages—when men and money and material must be used to the very fullest, there is one method of building that truly meets the need on every count—it's Ceco's Meyer steelform construction. For here is a building way that saves as it serves:

Saves men because less time and labor are required in providing open wood centering and form work.

Saves money because less concrete is used . . . the dead load is kept at a minimum . . . less lumber is needed . . . and since removable steelforms can be used over and over again, only a nominal rental fee is charged.

Saves material because only a minimum of critically short steel is needed —and even here less concrete is necessary than required by other concrete floor constructions.

Ceco originated the removable steelform method of concrete joist construction. The company is first in the field—actually providing more services than all competitors combined. So, when concrete joist construction fits the need, call on Ceco . . . the leader over all.

CECO STEEL PRODUCTS CORPORATION

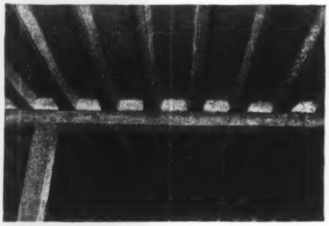
General Offices: 5601 West 26th Street, Chicago 50, Illinois

Offices, warehouses and fabricating plants in principal cities

CECO STEEL®

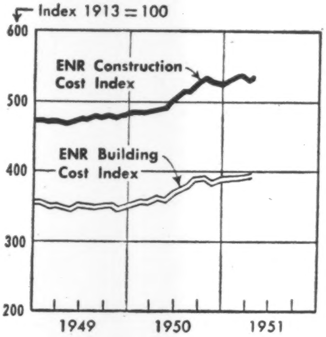
In construction products **CECO ENGINEERING** *makes the big difference*

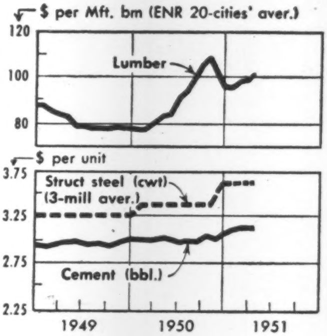
HOSPITALS—Ceco Concrete Floor Joist Construction is ideally suited to hospitals since it provides fire-safe, sound-proof buildings at economical cost. Widely used in Veterans Hospitals.

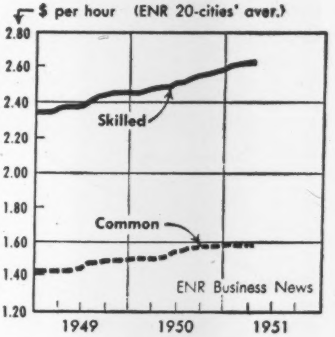


CONCRETE JOISTS eliminate much of the concrete below the neutral axis, saving money, saving material. Suited to buildings with long spans: stores, offices, apartments, hotels.

APRIL CONSTRUCTION SCOREBOARD







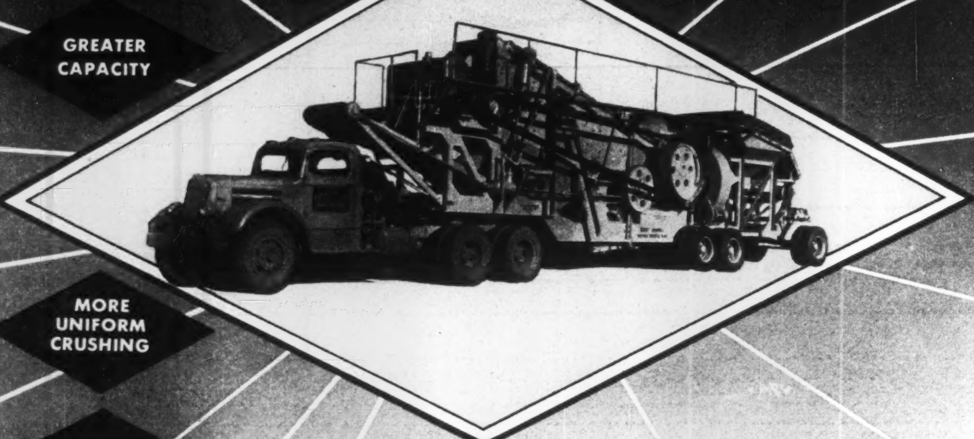
ENR INDEXES (1913 = 100)	Apr. '51	Mar. '51	% Change	Apr. '50	% Change
Construction Cost	538.69	537.90	+0.1	491.94	+ 9.5
Building Cost	398.78	397.99	+0.2	362.78	+ 9.9
MATERIAL PRICES (20-cities' average)					
Cement, bulk, per bbl	3.148	3.148	0.0	2.961	+ 6.3
Structural Steel, (3-mill aver.), per cwt	3.650	3.650	0.0	3.400	+ 7.3
Sand, per ton	2.090	2.090	0.0	1.973	+ 5.9
Lumber, 2x4 Fir, per M. ft. bm	109.647	109.353	+0.3	89.162	+22.9
Lumber, 2x4 Pine, per M. ft. bm	93.583	92.450	+1.2	79.033	+18.4
Common brick, per M	31.175	31.175	0.0	27.987	+11.4
Ready-mixed concrete, per c. y	10.925	10.925	0.0	10.313	+ 5.9
Structural Clay Tile, 3x12x12 per M	143.339	142.431	+0.6	132.900	+ 7.8
WAGE RATES (20-cities' average)					
Common	1.595	1.595	0.0	1.493	+ 6.8
Skilled (aver. 3 trades)	2.619	2.619	0.0	2.478	+ 5.7
Bricklayers	2.895	2.895	0.0	2.739	+ 5.7
Structural Ironworkers	2.568	2.568	0.0	2.447	+ 4.9
Carpenters	2.393	2.393	0.0	2.247	+ 6.5

	MARCH		%	THREE MONTHS		%
CONTRACTS AWARDED (thous.)	1951	1950	Change	1951	1950	Change
Total U. S. (ENR reported)	$1,406,456	$993,453	+ 41.6	$3,944,413	$2,595,149	+ 51.9
Private	884,358	623,415	+ 41.8	2,499,583	1,463,500	+ 70.8
Public	522,098	370,038	+ 41.0	1,444,830	1,131,649	+ 27.7
Federal	177,524	75,860	+134.0	533,187	415,167	+ 28.4
ENR Constr. Volume Index, '13 = 100	558	434	+ 28.6	625	445	+ 40.4
NEW CONSTRUCTION CAPITAL						
Total	339,617	381,688	− 11.0	3,835,235	1,107,112	+246.4
State & Municipal Bond Sales	247,983	274,442	− 9.6	670,360	664,360	+ 0.9
Corporate Security Sales	91,634	107,336	− 14.6	488,990	442,752	+ 10.4
Federal (non-federal work)	....	....	....	73,425	....	....
Federal (federal work)	....	....	....	2,602,460	....	....

	February (F) January (J)		%	Two Months		%
MATERIAL SHIPMENTS & LABOR SUPPLY	1951	1950	Change	1951	1950	Change
Cement, thous. bbls., Bu. of Mines	12,237(J)	9,632(J)	+27.0	....	....	....
Fabr. Struc. Steel, thous. tons, AISC	155(F)	130(F)	+19.2	332(2)	275(2)	+20.7
Lumber, mil. ft. bm., NLMA	3,199(J)	2,633(J)	+21.5	....	....	....
Lumber Prod., mil. ft. bm., NLMA	3,005(J)	2,387(J)	+25.9	....	....	....
Contract Constr. Employ., thous. BLS	2,195*(F)	1,861(F)	+17.9	(Av.) 2,236(2)	(Av.) 1,890(2)	+18.3

* Preliminary.

[illegible] a DIAMOND!



GREATER CAPACITY

MORE UNIFORM CRUSHING

CONSTANT MATERIAL FLOW

LESS DOWN TIME

HIGHER PRODUCTION

LOWER TON COST

BUILT TO KEEP YOU IN BUSINESS..at a PROFIT

DIAMOND'S *"Line-Flo"* principle eliminates bottlenecks . . . gets out MORE MATERIAL!

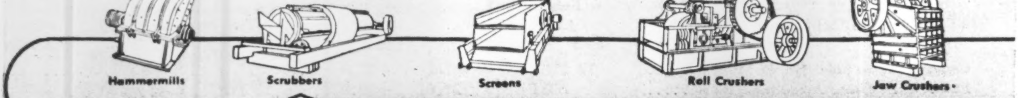
Straight through run of material—without *extra scalpers or by-passing*—provides the high production runs that assure you tops in profits. Diamond's specialized engineering skill plus years of experience in crusher design combine to produce a compact integrated plant that can be depended on for *any* aggregate processing job.

Five size Portable Rotor-Lift Plants with capacities up to 200 cubic yards per hour meet *every* crushing need. The millions of tons of low cost aggregate produced by them best demonstrate their ruggedness . . . their low upkeep . . . their dependability . . . the reason why Diamond is your best buy.

DIAMOND *Portable* PRIMARY CRUSHING PLANT is for extra heavy duty rock busting . . . feeds to following secondary crushing and screening operations. Five size plants available with 15" x 24", 15" x 36", 20" x 36", and 30" x 42" Jaw Crushers.

Write today . . . for Rotor-Lift Plant Bulletin D-50-G and Quarry Plant Bulletin D-48-A.

Everything. . . for the aggregate producer



Portable Plants

DIAMOND

DIAMOND IRON WORKS, INC.
AND THE MAHR MANUFACTURING CO. DIV.
1766 N. 2ND STREET, MINNEAPOLIS 11, MINNESOTA

EDITORIALS

Highways are not expendable

It is gratifying to note that there is a growing appreciation of the fact that our highways are not expendable. Representatives of the military, Congress, Bureau of Public Roads, state and municipal highway departments, and industry attested to this fact at the recent American Road Builders Association convention in Milwaukee.

The preceding cheery paragraph was written, however, before James K. Knudson, executive director of the Defense Transportation Administration suddenly appeared on the scene with a message to all state governors to liberalize their truck weight limitations. He is on safe enough ground when he asks removal of "restrictions intended to harass and burden highway transportation to obtain competitive advantages for other modes of transportation." But he also demands such things as a letup in inspections that hold up movement of goods, and a relaxation of Spring thaw restrictions.

That is the first step toward a federal policy that would result in a useless waste of a national asset upon which the country has spent several billion dollars just to make good the damage caused in World War II, when a similar laxity regarding truck weights was in vogue. This time, any tampering with load limits should be tempered with due regard to the overall national interest. It should also be tempered in accordance with the principle that highways are not expendable—because we do need them for the defense effort and might need them to repel invasion.

As a matter of fact the most pressing problem of the moment is to assure that the highway system will be continuously maintained in an efficiently operable condition. There is currently great confusion among roadbuilding agencies as to how much and when definite allotments of construction materials will become available. Two things, urgently needed, are: Early determination of the essentiality of highways—and of what highways—in the overall picture of national defense; and a system of allocating roadbuilding materials speedier and more efficient than the individual project-priority system used during World War II.

The Bureau of Public Roads has been designated as claimant agency to present material requirements for highway construction and maintenance, whether or not federal aid is involved. With its decentralized field organization and its close liaison with state highway departments, the BPR is also better fitted to supervise the allocation of strategic roadbuilding materials than any other governmental agency; or any centralized agency that could be established. Once delegated with the proper authority to allocate strategic materials and issue priority ratings for highway construction and maintenance, the BPR should lose no time in implementing the orderly flow of materials to essential state, city and county highway projects.

Clear thinking and intelligent action at the national level are needed to put such a program into action. And it should be based on the principle that our highways are not expendable—any more than a fine machine tool, upon which airplane engine production depends, is expendable by careless operation or lack of proper maintenance.

Ambassador of engineering

The death of Theodore T. Knappen on March 20, at the untimely age of 50, ended an engineering career that should be noted well. For, in these times of our country's growing position in world affairs, there are not enough American engineers willing and able to seek opportunities for engineering service in foreign lands. Ted Knappen was one of the few who was not only willing, but who had the ability and the courage necessary for this highly important task.

Those who knew Ted Knappen only since he formed his own consulting firm in 1942 will be apt to attribute his unusual success to his business ability. Without question he had that ability—compounded of a pleasing personality, a driving ambition, a liking for people and a talent for making both clients and colleagues sure that he was working in their interest.

But basically he was an extremely capable engineer who had spent 20 of his 30 business years on the brain-tiring and hand-soiling details of office and field routine. During this period his work as chief of engineering on the Muskingum Valley flood control project, in which he applied the service of the soils laboratory to the field problems of the earth-dam builder, set a pattern that is now standard practice.

It was because Ted Knappen was first an experienced engineer—and only second that he was a fine business executive—that he could later develop a successful consulting business both domestically and abroad. And it was because he was an engineer, who loved engineering, that he was drawn to the challenge that foreign jobs offered—even in some cases to those that were long on challenge and short on cash returns.

The roster of eminent engineers of the past is studded with the names of those remembered for great structures or significant inventions. Ted Knappen joins their company on a different, but comparably illustrious basis. At a time when American prestige in the world rested on her technology and her willingness to share it, he made himself an instrument not only for helping in this task, but for carrying it out in the private enterprise manner for which America is noted abroad. Ted Knappen's career as a U. S. engineering ambassador deserves to be remembered and more widely emulated.

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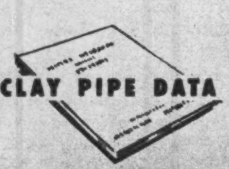

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ENGINEERING NEWS-RECORD

APRIL 5, 1951 VOL. 146 NO. 14

Wilson sees large scale industrial construction

First report on defense build-up shows industrial construction receiving large share of $24 billion for 1951—Highways and electric plants get high ratings

Proportions of the defense build-up, present and future, were revealed this week by Mobilization Director Charles E. Wilson in his first report to President Truman.

Specifically, Wilson sees a slight decline in total construction for the current calendar year, despite the record volume in the first quarter. This volume was the result of the addition of large-scale industrial plant expansion to the continuing housing boom.

• **For the defense plant**—Industrial construction will continue high. It's a large portion of the estimated total expenditure of almost $24 billion during 1951, as against $18.5 billion for 1950. But the home building rate is tapering off, as credit restrictions and materials shortages take their toll. But still Wilson anticipates total construction this year will be only slightly below the 1950 level, and substantially higher than in 1949.

Typical of the anticipated continued rise in industrial construction is the blueprint for expansion of electric-generating capacity endorsed by Wilson. Power capacity, he said, needs to be increased by more than 30%—from the present 67.5 million kw to 89.5 million kw by 1953.

However, some major construction projects must be cut back, Wilson warned. These include government programs like reclamation and rural electrification, which have been "slowed down."

• **Highways receive attention**—On the other hand, a high level of highway improvement is in the works. Though snarls in other forms of transportation have developed, only "scattered shortages" have affected trucking. That means, Wilson concluded, "we must pay particular attention to the maintenance of the capacity of our highway system."

Shortages of metals, Wilson pointed out, constitute the principal bottleneck in both defense and civilian production. To direct the flow of critical metals, "a form controlled materials plan . . . will be placed into effect later in the year."

Manpower is another imminent problem. Wilson figures defense production will require 3 to 4 million more workers this year. But there will be no involuntary draft of labor. Instead, he hopes the labor shortage will be met by those unemployed at present, the retired and handicapped, and, principally, by bringing women back into the factories in large numbers.

As Wilson now sees it, the nation is in for three years of intensive—but short of all-out—mobilization. It will be the kind of effort that will force comparatively slight curtailment in most major industries, like construction, but call for virtually maximum expansion in others, like electric power production. In such an effort, Wilson believes defense expenditures will take about 20% of gross national product. That's less than half, percentagewise, of the peak World War II slice into gross production. This means fewer new automobiles and appliances, less housing starts in 1951-53. But, in Wilson's words, "few goods will disappear completely from the market."

Costs hold steady for second month

For the second straight month, materials prices and construction costs have held with only slight upward changes—in fractions of percentage points—according to reports to ENGINEERING NEWS-RECORD.

The steadiness of these vital indicators may be a result of the effects of controls imposed within the past several months. Nevertheless, in a general atmosphere of a skyrocketing commodity prices and despite evidence of future pressure the absence of a sharp change is significant.

• **Indexes steady**—The ENR Construction Cost index for April is 538.69, the ENR Building Cost Index is 398.78 (see also p. 19).

These figures (base 1913 = 100) represent gains of only fractions of a percentage point over the index for March. The Construction Cost figure being up 0.1% over the previous month; the Building Cost index up 0.2%. The figures are, however, well above indexes for the same month of 1950—9.5% and 9.9% respectively.

• **Materials hold line**—The small rises in the two major indexes are based on a surprisingly few changes in prices during March in the eight materials and five trades checked by ENR reporters for its monthly 20-city average of materials prices and wages.

Prices of bulk cement, structural steel, ready-mixed concrete were reported unchanged. Additionally, prices on welded wire fabrics concrete form grade plywood, explosives and red and white lead (not components of the 20-cities average) also were unchanged.

Only three materials showed price rises: 2x4 Fir is up 0.3%; 2x4 Pine is up 1.2%, and structural clay tile (3x12 x12) is up 0.6%.

Wage rates for common and skilled labor, bricklayers, structural ironworkers and carpenters were also reported unchanged.

The U. S. Bureau of Labor Statistics' weekly average of primary market prices March 27 also showed steadying in the construction market. While the general market price average (based on a 1926 average) mounted to a new high at 183.9 the Building materials and metals and metal products components of the index has remained unchanged over three weeks.

• **Pressures mount**—Despite the apparent steadiness in the indexes, however, reports on production during the last week indicate heavy pressures to come.

For example, the American Institute of Steel Construction reported that bookings of fabricated steel still far outrun shipments. For the first two months of 1951, said AISC, bookings were 486,966 tons—105% above the same period in 1950. Shipments in the first two months of 1951 were 331,645—25% higher than in 1950.

Lumber also was heading for greater strictures. In the week ending March 17, reported the National Lumber Manufacturers' Association, both shipments and new orders topped production at 434 mills. At the same time, the group reported that unfilled orders amounted to 64% of gross stocks.

AEC awards $45 million plant contract

The U.S. Atomic Energy Commission last week announced the award of a contract to the Austin Co., of Cleveland, for construction of a new $45,000,000 facility. (See also p. 28)

The facility is to be located in the Rocky Flats area of Boulder and Jefferson counties, Colorado, on a four-square-mile tract. Acquisition of land for the facilty—which AEC classified as secret—will begin immediately under direction of the Missouri River Division of the Corps of Engineers.

On completion, the plant will be operated by Dow Chemical Co., Midland, Mich. An official announcement said that the new plant will employ about 1,000 persons when operating fully.

W. R. Engstrom, Austin vice-president who has been in charge of construction at the AEC's Argonne Laboratories near Chicago, will be project manager for Austin during construction. Building probably will begin late in April, after completion of engineering studies; total construction employment is expected to reach a peak of about 2,000 in early 1952.

A new AEC field office will be established at the site, with David W. Persons, of the regional operations division, office of engineering and construction at Los Alamos, N. M., as project engineer.

Atomic Energy Commission officials said that, so far as possible, construction contracts will be let on a competitive, lump-sum basis. They added that the new project will handle radioactive material (as do many other AEC installations); and said the plant will have "only moderate" water, gas and electricity requirements.

Unions threaten strikes over decision by NLRB

AFL building trades unions are raising the threat of jurisdictional strikes, as a result of the decision of the National Labor Relations Board to hold bargaining representation elections in the construction industry.

Against the wishes of the powerful AFL Building Trades Department (and directly contrary to decisions made by former General Counsel Robert Denham) the plumbers' union got NLRB to agree to hold an election among plumbers, apprentices and gas fitters employed by members of the Plumbing Contractors Association of Baltimore.

NLRB also ordered a union shop authorization poll requested by Plumbers' Local 500, Olean, N. Y.

The elections are the first ordered by NLRB for the construction industry. Denham tried to organize elections in Detroit, Philadelphia and other cities—finally gave up with the opinion that construction employment is too filled. (ENR Feb. 22, p. 17).

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Canso Strait problem

The only major engineering problem to be overcome in the construction of a bridge over Canso Strait, to connect the Nova Scotia mainland with Cape Breton Island (ENR April 7, 1949, p. 17), involves deep water, according to P. L. Pratley, consulting engineer on the project. Water at the bridge site is 175 ft deep.

Charles A. Mead dies; designed many bridges

Charles A. Mead, 81, consulting engineer and former director of the ASCE, died March 28 at Upper Montclair, N. J. He was a graduate of Pratt Institute and taught engineering subjects there for a time. He was with Boller & Hodge in New York from 1898 to 1907, and from the latter date till 1940 he was chief engineer of the division of bridges and grade crossings of the New Jersey Railroad Commission.

Besides designing many bridges, highways and power stations in New Jersey, Mr. Mead also worked on engineering projects in South and Central America and in the Philippines.

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Road contractors pressed by Dallas County officials

The County Commissioners Court at Dallas, Texas, has decreed that henceforth the County of Dallas will decide the time limit for completing projects in its road bond program—instead of letting participating contractors name the time. The decision was made to accelerate operations on Dallas County's $22.5-million road bond program.

County Engineer Jack Davis and J. D. Fowler, consulting engineer, are authorized to name completion dates on all future contracts. Contractors not finishing their work on time are to be sued.

The court also decided that contractors engaged at present on $4-million worth of contracts must complete their jobs within the time limits they set, or be sued.

New offices for Rivers and Harbors engineers

The Board of Engineers for Rivers and Harbors last week moved its offices and staff of more than 100 to 119 D Street, N. E., Washington, D. C. (near the Union Station).

Board meetings will continue to be held in Building T-7, Gravelly Point, Va., near the National Airport.

Col. Heston R. Cole, resident member of the board, is head of the Washington office.

Free St. Lawrence power, Dewey asks

As Governor Thomas E. Dewey signed legislation recently extending the jurisdiction of the New York State Power Authority to include Niagara as well as the St. Lawrence River, Howard S. Cullman, chairman of the Port of New York Authority took exception to wrapping up the St. Lawrence Seaway project "in the flag."

Gov. Dewey in his memorandum issued on signing renewed his criticism of the federal government in not allowing the state to develop St. Lawrence electric power potential.

The Governor claimed that power development would not hamper the Seaway if the project goes through.

Cullman before the Rotary Club of New York City said the seaway would cost much more than its advocates claim, and bring in much less than they anticipate.

In regard to the power phases possibile in the International Rapids section, Cullman said:

"The Port Authority takes no position on the power phase of the proposed development. But the hydroelectric facilities can be developed independently of the proposed Seaway.

"It is a fact," Cullman said, "that development of this project would have a critical effect on the commerce in the Port of New York. But in addition, the citizens of this area would be called upon to pay one-fifth the annual bill of at least $60,000,000 that would be borne by the taxpayers of the United States."

ENR index ready

The semi-annual index of ENGINEERING NEWS-RECORD, July-December, 1950, is ready for distribution. Copies will be sent automatically to all who have ordered earlier indexes in recent years. Copies will be supplied free of charge also to other subscribers who request them.

Requests should be directed to the Editor, ENGINEERING NEWS-RECORD, 330 West 42nd Street, New York 18, N. Y.

Sumner Wing dies, headed Reclamation's Point Four

Sumner P. Wing, 60, for the last four years in charge of foreign activities programs of the Bureau of Reclamation, died suddenly March 22. He had been making plans to leave soon for Libya as the leader of an engineering team that will lay the groundwork for a water resources development program in that country.

Wing had been with the Reclamation Bureau for 21 years; he was stationed in Denver until four years ago. In 1947 he moved to Washington and became special representative to cooperate with the State Department and to serve as liaison officer with irrigation engineers and officials of foreign nations. These activities—exchanging engineering information and personnel with foreign governments—later were incorporated in President Truman's point four program.

Before joining Reclamation, Wing was chief civil engineering designer and assistant to the chief engineer of the British Columbia Power Corp. He had also done engineering work in Italy and Korea.

Building funds run out for Delaware Bridge

All members of the Delaware State Legislature have received a letter from J. Gordon Smith, chairman of the State Highway Commission saying that want of $3,900,000 may delay opening of the $40,000,000 Delaware River Memorial Bridge. (ENR Dec. 21, p. 29).

In his letter Smith pointed out that "there are not enough funds for the crossing division of the State Highway Department to oblige itself to complete the approach roads on which bids were taken Feb. 26, 1951. The necessary funds for the completion of the structure must be authorized by the Legislature before these contracts can be completed."

The bridge was scheduled to open July 1 of this year. Authority is needed to issue further revenue bonds to complete the bridge, the letter said.

Slide closes parkway

The Tanbark Ridge Tunnel ten miles east of Asheville, N. C., has been closed by a large rock slide.

Descent of the rocks has made the Blue Ridge Parkway unusable for some 40 miles. The road will be closed for at least five weeks.

Heavy equipment for removing the rock will have to be obtained through letting the job of clearance to private contractors. Parkway officials do not have the needed equipment.

Brig. Gen. Claude Chorpening

Chorpening is new chief for C. of E. civil works

Claude H. Chorpening, recently promoted to the rank of brigadier general and assigned as Assistant Chief of Engineers for Civil Works comes to his new job with wide experience in construction and military engineering to draw on. For the last year and a half chief of the Personnel Division of the Corps of Engineers, General Chorpening had been district engineer at Tulsa, Okla., during the three years prior to that. In that period there were under way in the district such projects as Fort Gibson Dam (where ice was introduced into concrete making), Canton Dam, Fall River Dam, and the dam at Tenkiller Ferry. Back in prewar days, General Chorpening was one of the first officers assigned to Fort Peck Dam, and he remained on that largest of hydraulic-fill jobs until 1939, for the most part on field construction supervision.

A 1918 graduate of West Point, General Chorpening has also served as executive officer of the New Orleans district and as district engineer at St. Paul. During most of 1945 he was district engineer at Honolulu and chief of the construction service, Central Pacific Base Command.

General Chorpening's war record is equally distinguished. Assigned to the European theater in 1943, when we were building airbases and other installations in England, he was later appointed deputy commander of the advance section of the Communications Zone during the invasion, and then became commanding officer at Cherbourg immediately after the occupation. Toward the end of the war he was chief of staff of the United Kingdom Base. In his new post he succeeds Col. W. E. Potter, who has been designated Assistant Chief of Engineers for Special Projects.

Engineering mechanics is new division of ASCE

Organizational problems are currently being ironed out to put the newest division of the American Society of Civil Engineers on an operating basis. This is the Engineering Mechanics Division, which plans to hold its first meeting at the society convention in New York next October.

Six technical committees are planned: (1) Applied Mathematics and Numerical Methods, to develop and to encourage the application of analytical tools to civil engineering problems; (2) Experimental Analysis and Analogues, to foster the development and use of experimental methods and the utilization of techniques from other fields; (3) Fluid Dynamics, to promote the study of basic problems in the flow of liquids and gases. Also (4) Mechanical Properties of Materials, to investigate and to correlate studies of the fundamental properties of engineering materials; (5) Plasticty Related to Design, to study the phenomena of plastic behavior in structures and the application of the findings to design; and (6) Structural Dynamics, to study the behavior of structures under impulsive loading, including blast, earthquake and periodic forces.

The membership of the first executive committee of the division includes Arthur T. Ippen, Nathan M. Newmark, Douglas McHenry, Ralph E. Fadum, and Linton E. Grinter, chairman. Clayton O Dohrenwend is secretary.

Bond issue of $66,703,625 authorized for road work

Authorization of a $66,703,625 bond issue to accelerate highway construction in Washington State has been signed by Gov. Arthur B. Langlie. Early court action will test legality of the measure.

The bonds would be issued against gasoline tax collections. They would include $49,000,000 for modernization of the Pacific highway in western Washington, and funds for the addition of a truck lane at Snoqualmie Pass on the principal east-west highway through the Cascade mountains, a new bridge over the Columbia River, and new roads in the Columbia basin irrigation project.

Other money bills signed by Langlie: issuance of $5,000,000 in bonds toward construction of a $10,000,000 hospital by the University of Washington Board of Regents.

Housing meet: much talk, little action

The National Housing Policy Conference, held in St. Louis March 19-20, heard many talks on low-cost housing and produced much discussion of government versus private industry in this field.

The two-day meeting, attended by more than 450 persons said to represent 35 states, industrial, financial, labor, religious and civic interests, was called by Mayor Joseph M. Darst of St. Louis.

Mayor Darst's letter of invitation to the conference stressed the necessity for the "cities of America to maintain gains for good housing and good planning that were made possible under the Housing Act of 1949."

This brought some repercussions in letters declining the invitation. Herbert Nelson, executive vice-president, National Association of Real Estate Boards, wrote, "We are definitely opposed to public housing and to rent control. We feel that in both of these fields our federal government has gone far astray."

Ralph Duke, a past president of the St. Louis Home Builders Association, charged that the conference at the Hotel Jefferson was "dominated by the public housing people." He added that St. Louis home builders feel the meeting was an attempt to boost public housing at a time when private builders are penalized by credit controls if they do all the building of which they are capable."

Other angles appeared. William J. Levitt, New York, celebrated builder of mass-produced housing, in a speech criticized Congress for "pussy-footing" and failing to speed passage of a national defense housing law.

"I am for a defense housing bill," he declared, "because there can be no housing to any appreciable extent in this day and age of defense preparation unless enabling legislation of some sort is passed."

The conference went on record as favoring modern building codes, the granting of increased federal aid for technological research and the centralization of all phases of the defense housing program under one administrative head.

After a lengthy debate, delegates opposed a resolution calling for nonsegregated housing, proposed by two Negro groups.

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It's safer with AEC

The injury rate of the national Atomic Energy program last year went down 22% as against 1949.

The construction injury rate for AEC projects last year was 8.35 million man-hours worked. In 1949 the rate was slightly more than ten.

This contrasts favorably with all U. S. construction whose rate in 1949 was 19.48 as reported by the National Safety Council.

PIONEER—Walnut Lane Bridge in Philadelphia, which attracted considerable attention as the first prestressed concrete bridge to be started in the U. S., was opened to traffic Feb. 1. It carries a four-lane highway over Paper Mill Creek Valley. (ENR Jan. 18, p. 39). Thirteen 160-ft main-span girders and fourteen 74-ft approach-span girders were precast, then prestressed with 0.276-in. dia wires. Henry W. Horst was general contractor. Prestressing was subcontracted to the Preload Co. of New York City.

Steel shortage may halt California public works

Two top California officials are expressing concern over the future of public works projects in the state.

Charles H. Purcell, state public works director, warns that unless California can get special priority on steel and other construction materials, freeway building and other highway expansion projects may stop.

Purcell points out that California's problem is unlike that of states which have had no substantial increase in population. "We can't resort to the railroads," he said, "because there are many communities which have no rail service. Unless some of our highway projects are completed, we will have undreamed of congestion during the current emergency. It will be far worse than it was during World War II."

State Director of Finance, James S. Dean, claims that contractors are increasingly unwilling to enter firm bids on public projects—including badly needed schools.

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Calcium carbide plant to cost $10,000,000

Construction of a new $10,000,000 plant just outside of Paducah, Ky., at Calbert City will begin July 1 of this year. The plant will turn out calcium carbide for Air Reduction Co., Inc., and will be operated by National Carbide Co., one of Air Reduction's ten operating divisions.

About 1,000 construction workers will be employed on the plant at the peak of activity, rushing it to completion by January 1, 1953.

The installation will consume more than 1,000,000 kilowatt hours of TVA electricity per day, or enough to meet the normal requirements of a city of 250,000 population. The two furnaces of the plant will have an initial rated capacity of 142,500 tons of calcium carbide per year.

The plant has been designed and will be constructed by United Engineers & Constructors of Philadelphia.

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Army plans new laboratory

The Department of Defense has announced plans for the construction of an $11,000,000 Army Quartermaster research laboratory to be built in Natick, Mass. The 20-acre site will allow ample room for the 320,000 sq ft of floor space planned.

The laboratory will be devoted to a study of all phases of human reaction to environment, and man's resulting food, clothing and military equipment needs under many conditions.

CONSTRUCTION BUSINESS

Construction quarter tops $3.9 billion

U. S. engineering construction contracts hit another new peak this quarter—reaching a total of $3,944,413,000 for the first three months of the year, 52% higher in total value than they were in the same period of 1950.

The total includes $2.5 billion for private construction, a 71% jump over private work put under contract in the first three months of 1950; and public works totalling $1.4 billion, a 28% rise over the same period 1950.

Total contract awards for the five weeks of March alone (including public and private work) were $1,406,456,000, compared to $993,453,000 for the same month of 1950—this March the highest on record.

Biggest factor in the cumulative total for 1951 continued to be industrial buildings, on which to date $1,509,490,000 worth of contracts have been let—a rise of 442% over the $278,514,000 awarded in this category in the first three months of 1950. Other major factors in the three-month total included: Public buildings, residential, $163,112,000, a 306% rise over 1950; unclassified at $290,010,000 a 139% rise over 1950.

Commercial buildings, residential, at $514,904,000 for 1951, and other commercial buildings, at $182,741,000, were down 38% and 22%, respectively, under last year's totals.

Geographically, the distribution of the work continued to follow the pattern apparent a month ago (ENR March 8, p. 27)—centering in the Middle Atlantic, South, Mid-West, and West of Mississippi states. In detail, reports from these areas showed:

Middle Atlantic—$616,162,000 for the month of March, a 24% rise over March, 1950; South—$366,665,000, a 146% rise over a year ago; Mid-west —353,010,000, a 101% rise; west of Mississippi, $596,676,000, up 76%.

New England, with $128,158,000 reported, was 27% below a year ago; the Far West, with $534,478,000 reported, was 20% below March, 1950.

◆

Materials production down

Production of building materials fell off to 154.2 in January, from 156.6 in December, as measured by the U. S. Department of Commerce Index of Production (1939=100). Adjusted for seasonal trends, however, the January production was at 180.6, compared to a similar adjustment that brings December up to 176.0.

Generally, the individual components of the index showed spotty results for the month. Lumber production, at 125.4, was down .2 below December; hardwood flooring at 186.8, was well above December's 169.8. Brick was listed at 122.0, well under December's 124.7. Cement production was also down, with 171.1 as compared to 187.6 for December.

Production of wire nails was up—138.8, compared to 123.6; fabricated structural steel was down—143.2 compared to 146.3; but reinforcing bars were up—147.1 compared to 143.9. Cast iron soil pipe and fittings were down, with an index of 216.1 compared to 231.6 for December.

Softwood plywood dropped, 250.3 for January compared to 279.1 for December; gypsum board dropped to 773.7 for January, from 785.4 for December; gypsum lath was up to 263.9 for January from December's 258.6. Asphalt siding (felts) rose to 220.4 from 169.5; structural clay tile rose to 122.3 from 109.3; and clay sewer pipe went up to 153.0 from 142.4 in December.

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New high in construction of sewage disposal plants

According to the American Public Works Association, Pennsylvania led the states in the number of sewage treatment plants under way in 1950, with 48.

Virginia had 40; Washington, 34; New York and Illinois, 33 each; and California, 26. The national total is more than 750.

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Aluminum cut further

NPA has ordered aluminum producers and fabricators to increase their set-aside for defense purposes by 15%; jobbers and distributors must increase their defense set-aside by 20%. Effective date is April 1.

Here are new requirements for producers and fabricators (the set-aside percentage is based on average monthly shipments during the first eight months of 1950):

Sheet, plate, circles and blanks—% for DO orders, 55%; extrusions and tubing—for DO orders, 60%; rod, bar, wire and cable—50%; castings—55%; rolled shapes—45%; forgings and pressings—75%; all other mill products, each—55%.

ENGINEERING CONSTRUCTION CONTRACTS REPORTED TO ENGINEERING NEWS-RECORD—MARCH, 1951

Engineering News-Record *reports continental U. S. Construction projects of the following minimum costs — Waterworks, excavation, drainage and irrigation*, $34,000; *other public works*, $60,000; *industrial buildings*, $82,000; *other buildings*, $300,000
Five Weeks — Thousands of Dollars (000 Omitted)

	March, 1951							U. S. Cumulative Three Months		% Change	Canada
	New England	Middle Atlantic	South	Mid-West	West of Mississippi	Far West	Total U. S.	1951	1950	'50 to '51	March, 1951
Public Works											
Waterworks	....	5,064	7,568	11,348	6,037	2,082	**32,099**	**62,220**	66,474	− 6	875
Sewerage	2,011	3,138	5,341	5,019	8,299	4,803	**28,611**	**81,603**	58,081	+40	1,140
Bridges	162	4,596	3,680	299	6,129	6,821	**21,687**	**66,160**	74,376	−11	1,170
Earthwork and waterways	1,103	2,238	5,233	314	5,752	28,033	**42,673**	**83,271**	95,292	−13	969
Streets and roads	953	4,467	22,932	15,079	44,821	12,332	**100,584**	**232,788**	232,267	+0.2	722
Public buildings, residential	7,105	4,383	4,466	2,993	5,456	4,937	**29,340**	**163,112**	40,149	+306	6,293
Other public buildings	8,692	47,801	24,456	19,699	72,045	46,934	**219,627**	**638,089**	469,102	+36	12,955
Unclassified	4,412	4,089	6,067	3,142	14,473	15,294	**47,477**	**117,587**	95,908	+23	4,390
Total public	**24,438**	**75,776**	**79,743**	**57,893**	**163,012**	**121,236**	**522,098**	**1,444,830**	**1,131,649**	**+28**	**28,514**
Federal government (included in above classifications)	5,869	25,900	18,372	10,740	62,797	53,846	**177,524**	**533,187**	**415,167**	+28	**5,958**
Private											
Bridges	....	....	....	....	243	86	**329**	**2,438**	1,465	+66	....
Industrial buildings	2,590	60,014	157,284	117,190	130,295	15,756	**483,129**	**1,509,490**	278,514	+442	12,205
Com'l. buildings, residential	1,318	26,847	28,743	32,767	53,460	10,165	**153,300**	**514,904**	827,780	−38	5,244
Other commercial buildings	2,110	8,864	15,024	16,176	16,084	6,255	**64,513**	**182,741**	234,582	−22	3,287
Unclassified	....	370	31,955	37,240	113,355	167	**183,087**	**290,010**	121,159	+139	475
Total private	**6,018**	**96,095**	**233,006**	**203,373**	**313,437**	**32,429**	**884,358**	**2,499,583**	**1,463,500**	**+71**	**21,211**
Total Engineering Construction:											
March, 1951 — 5 weeks	**30,456**	**171,871**	**312,749**	**261,266**	**476,449**	**153,665**	**1,406,456**	....	....	....	**49,725**
Feb., 1951 – 4 weeks	30,642	413,793	168,673	183,230	320,485	154,242	1,271,065	....	....	....	72,128
March, 1950 — 5 weeks	37,687	219,260	175,672	134,148	282,338	144,348	993,453	....	....	....	70,563
Three Months — 1951	**93,521**	**761,443**	**902,002**	**711,245**	**1,048,780**	**427,422**	....	**3,944,413**	....	**+52**	**244,839**
Three Months — 1950	128,158	616,162	366,665	353,010	596,676	534,478	....	....	2,595,149	....	130,771
% Change '50 to '51	−27	+24	+146	+101	+76	−20	....	....	....	....	+87

BIDS AND BIDDERS

(Major project news received after Construction Reports, page 62, went to press.)

Aircraft Parts Plants—Turner Construction Co., New York, N. Y. has been awarded two contracts at a total of $20,000,000 by the United Aircraft Corp. One project at Bradley Field, Windsor Locks, Conn., is for the Hamilton Standard Division, and will manufacture propeller blades. The other at North Haven, Conn. is for the Pratt Whitney Division, and will manufacture aircraft gas turbine aircraft parts. Albert Kahn Associated Architects & Engineers, Inc., Detroit, Mich., is architect-engineer on both plants.

Ore Refinery—United States Atomic Energy Commission has announced the selection of a site on the Miami River, 19 miles northwest of Cincinnati, O. for a $30,000,000 uranium ore refinery. Catalytic Construction Co., of Philadelphia, Pa. is engineer. Announcement was also made of plans for a $1,800,000 specialized research laboratory at Boulder, Col. Sterns-Roger Manufacturing Co., Denver, is engineer.

Steel Plant—Arthur E. McKee & Co., Cleveland, O., will construct a $15,000,000 manufacturing unit at East Chicago, Ind., for Inland Steel Co., Chicago, Ill. Frank Carroll, is project engineer for owner.

Health Research Center—Emory University, Atlanta, Ga., plans a health research center in Atlanta. Estimated cost is $12,000,000. Robert & Company Associates, Atlanta, are architect-engineers.

Pulp Plant—Weyhaeuser Timber Co., Tacoma, Wash., plans a pulp plant at Everett, Wash. Cost is estimated at $19,125,000.

Bridge—British Columbia Bridge & Dredging Co., Ltd., and Dawson Wade & Co., Ltd., both of Vancouver, B. C. will construct the central portion of Granville Street Bridge, in Vancouver, B. C. at $6,254,376. The City of Vancouver awarded contract.

Hospital—Bids will be opened May 24 for $10,000,000 municipal hospital, by the Department of Public Welfare, Springfield, Mass. Coolidge, Shepley, Bulfinch & Abbott, Boston, are architects.

Distillation and Cracking Plant—Canadian Kellogg Co. Ltd., Toronto, Ont., has been awarded a $9,000,000 contract for distillation plant, cracking unit and recovery plant at Sarnia, Ont., for Imperial Oil, Ltd., Toronto. This is part of a $25,000,000 improvement program.

Air Base—Graham, Anderson, Probst & White, Chicago, Ill., have been selected as engineer-architects for new $7,424,000 air base project at Scott Field, Ill., by the Department of the Air Force.

Aviation Gasoline Plant—Carroll B. Fulton and W. H. Olmstead, San Antonio, Tex. plan an aviation gasoline plant at San Antonio, to cost about $11,925,000.

Wharf—Merritt-Chapman & Scott Corp., and Raymond Concrete Pile Co., New York, N. Y. with Fletcher Construction Co., of Auckland, New Zealand, have been awarded a $5,137,409 contract to construct Import Wharf at Auckland, by the City of Auckland.

Texarkana Dam—U. S. Engineers, New Orleans, La. received low bid March 28, for spillway, outlet structures, dike and dam closure of Texarakana Dam, from Edward Peterson Co., Omaha, Neb., Foley Brothers, St. Paul, Minn., and Tellepsen Construction Co., Houston, Tex., at $5,576,725.

Military Housing—Haddock Engineers, Ltd., Seattle, Wash., was low bidder at $5,786,000 for constructing bachelor at Whittier, Alaska. U. S. Engineers, housing service and recreation center Anchorage, opened bids March 27.

Water Supply Dam—Greater Vancouver Water District, Vancouver, N. C. awarded contract for Capilano Dam for water supply to Gilpin-Nash Ltd., Vancouver, B. C., $5,769,216.

Radio-Chemistry Building—General Electric Co., Richland, Wash., prime contractor for Atomic Energy Commission, will open bids May 3, for radio-chemistry building at Hanford Works. Estimated cost is $4,000,000. L. S. Rosener, San Francisco, is engineer.

Catalytic Cracking Plant—Wood River Refining Co., Wichita, Kan., is taking bids for the construction of catalytic cracking plant and tank farm for oil refinery at Gary, Ind. Estimated cost $7,000,000.

Barracks—U. S. Engineers, Fort Worth, Tex., awarded contract to build barracks at Air Force Base, Amarillo, Tex. to Del E. Webb, Phoenix, Ariz., $3,942,000.

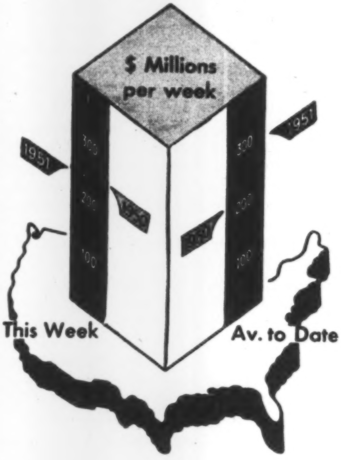
COSTS AND VOLUME

ENR INDEX NUMBERS

Index Base = 100	1913	1926	1949
Constr. Cost . Apr. '51	538.69	258.95	112.93
Bldg. Cost . . Apr. '51	398.78	215.57	113.36
Volume . . . . Mar. '51	558	227	161

Activity This Week

As reported to ENR
(in millions of dollars)



Amount of contracts let

	Week of Apr. 5	Cumulative 14 wks 1951	Cumulative 14 wks 1950	% chge
Federal	$30.4	$563.6	$437.1	+29
State & Mun.	63.8	975.5	782.3	+25
Total Public.	$94.2	$1,539.1	$1,219.4	+26
Total Private	142.5	2,642.0	1,628.3	+62
U. S. Total. .	$236.7	$4,181.1	$2,847.7	+47

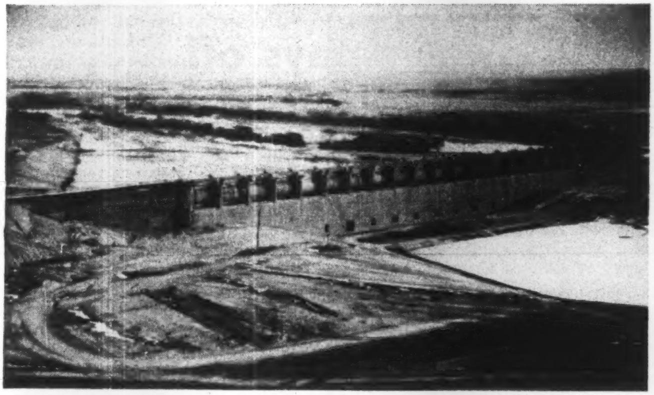
Contracts by type of work

	This Week	Cumulative 14 wks 1951	Cumulative 14 wks 1950	% chge
Waterworks .	$4.0	$66.2	$70.5	−6
Sewerage . . .	5.9	87.4	61.7	+42
Bridges	9.4	77.7	80.4	−3
Highways . . .	25.0	257.8	256.9	+0.3
Earthwork, Waterways .	3.6	87.0	107.3	−19
Buildings:				
Public	23.3	661.4	494.3	+34
Housg., pub.	7.6	170.8	50.3	+240
Housg., priv.	16.7	531.6	955.9	−44
Commercial.	9.2	191.9	246.4	−22
Industrial . .	82.1	1,591.8	295.1	+439
Unclassified .	49.9	457.5	228.9	+100

NOTE: Minimum size projects included are: Waterworks and waterway projects, $34,000; other public works, $60,000; industrial buildings, $82,000; other buildings, $300,000.

New capital for construction

	Cumulative 14 wks 1951	Cumulative 14 wks 1950	% chge
Corporate Securities	$490.5	$490.2	+0.6
Fed. loans, Priv. Constr.	0	0	0
State and Municipal:			
Excl. housing . . .	524.3	505.8	+4
Housing	164.2	190.7	−14
Fed. Aid, non-fed. constr.	73.4	0	0
Total Non-Federal. .	$1,252.4	$1,186.7	+6
FEDERAL	2,602.4	0	0
TOTAL CAPITAL. .	$3,854.8	$1,186.7	+225



SAFETY VALVE ON THE REPUBLICAN—Flood control for 27,000 acres of rich farm land in southern Nebraska and irrigation of 90,000 acres in Kansas and Nebraska will be furnished by the Harlan County Dam, nearing completion on the Republican River. Closure of the 11,830-ft long, 107-ft high, 12,000,000-cu yd rolled earth fill will be made this summer, with project completion scheduled for next year. The $49,897,000 project, being built under the supervision of the Kansas City District, Corps of Engineers, also will be used to augment deficient flows in the Republican, Kansas and Missouri rivers for abatement of stream pollution, increased water supply, and as an aid to navigation on the Missouri.

Milwaukee sewer finding: neglect charge unfounded

Allegations made last May that Milwaukee sewer construction was faulty as a result of neglect have now been declared completely unfounded (ENR June 15, 1950, p 27).

It was a grand jury that made the charges, listing 16 examples of alleged deficiencies. Contradiction of the charges comes from a panel of three engineers, upholding the judgment and practice of the city's bureau of sewers and calling the criticism unwarranted.

A city probe, urged by the grand jury in its report citing neglect, was undertaken by City Attorney W. J. Mattison, who submitted all available data to the panel of three: J. G. Woodburn, head of the department of civil engineering, University of Wisconsin; O. N. Olson, director, department of civil engineering, Marquette University; and Ralph Earle, Line Material Co., Milwaukee. Mr. Earle, in turn, consulted with F. A. Luber, chief architectural engineer of Wisconsin Electric Power Co., who submitted a separate report.

All four declared the neglect charges unfounded.

In a report issued last July in answer to the grand jury allegations, Lloyd D. Knapp, city engineer and acting superintendent of the bureau of sewers, outlined organization of the bureau and defended its procedures. Item by item, this report outlined Mr. Knapp's findings on each of the charges made, and it concluded: Five items were not violations of specifications at all: two items were violations corrected before final payment and seven were minor violations.

Indiana sanitation tax OK'd by court

A ruling by the Indiana Supreme Court last week cleared the way for a large-scale sewage program and made possible other construction held necessary to the well-being of Indianapolis.

The city's $50-million, long-range sewage plan had been held in abeyance since early in 1949, awaiting the final decision on litigation which grew out of the decision of the upstate city of Hammond to sell a $300,000 bond issue to finance an extension of its sanitary facilities to nearby Munster.

A Hammond taxpayer challenged the right of a sanitation district to levy a special tax, in addition to property taxes levied by a city. The Lake County Superior Court upheld the citizen. Thereupon, major sanitary projects in the state were halted until a final decision was forthcoming from the Indiana Supreme Court (ENR Jan. 4, p. 112).

In effect, the decision lets cities set up separate tax districts.

Indianapolis is proceeding at once to float a $25-million loan for sewage purposes; the program that will be carried out eventually is expected to cost $50 million.

• **Green light for other projects**—The Hoosier capital also now can proceed with plans for $3 million worth of construction at the Municipal Airport (the federal government will contribute half of the amount) and a long overdue expansion of the city's General Hospital.

Inaugurated immediately will be construction of new sewerage, repair and improvement of existing systems and improvement and expansion of the sanitation plant. The immediate program is estimated to cost $5 million.

The Indianapolis Sanitary District can borrow up to approximately $25 million for its needs—this eases the strain on the city's bonded indebtedness, limited by law to 2% of the assessed property valuation.

N.Y. State backs water fluoridation

Fluorides have passed the Kingston-Newburgh test. Newburgh children, drinking sodium fluoride in their city water since 1945, have shown 33% less tooth decay than the same age group in the control city, Kingston. New York's Department of Health is convinced—has officially recommended fluoridation of public water supply throughout the state.

The 10-year experiment, which has attracted nationwide interest (and some from abroad), has borne fruit ahead of schedule. According to Dr. Herman E. Hilleboe, state commissioner of health, "six years of control data provided by Kingston has resulted in such a well-established baseline with which to compare the findings in Newburgh that its status as a control city may . . . be changed. Accordingly, fluoridation need not be held up if the professional groups, city officials and lay groups involved deem it desirable."

It was indicated that the study of fluoridation effects will continue through 1954. And it was reported that Newburgh's 5- to 6-year-olds with no sign of decay in their first teeth increased 115% since the start of fluoridation. Yearly cost of fluoridation is about 10 cents per capita.

With the way cleared for any New York community to make application to the State Department of Health for permit to begin fluoridation, New Rochelle appeared to be first in line with plans already worked out. Rochester, too, is about ready to start.

France's push for kilowatts pays off

Waldo G. Bowman
Editor

PARIS, MARCH 3—When France's President Vincent Auriol arrives in the U. S. late this month (Note: he arrived March 28) he will have something significant to talk about. For the first time since the beginning of the war there are no restrictions on the use of electricity in his country. Factories can work when and as long as they wish. Office workers no longer have to walk up six flights of stairs as they did when power for the elevators was shut off during certain hours. You can push a switch anytime day or night and have light.

Less than a year ago, this happy state of affairs did not exist—nor for a decade prior to that. Three years ago (ENR July 17 and 31, 1947 vol pp 82 and 148) it was only a dream, albeit one based on a carefully worked out plan for electric power from both water and steam. Then the dream seemed over-ambitious, considering the political and economic disorder of the country. Yet, today, despite continuous and continuing political instability, France has provided its people with visibly higher living standards and a look into an even brighter economic future.

The reason is that the postwar push for kilowatts of electric power has paid off. And it has paid off because French engineers and construction men, along with French industry, have been willing to work hard and intelligently to create the necessary dams and the power plants.

In 1947 the output was about 26 billion kwh. It increased to 29 billion in 1948, to only 30 billion in 1949, because of a record-breaking drought, but then jumped to 33 billion in 1950.

• A Fine Record—None of these years reached the goals set by the economic planners, yet none was more than 11% under the target—a truly remarkable achievement. It comes into clearer focus when it is noted that, in 1950, generators with a total capacity of 400,000 kw were put into 8 new steam stations, while 14 new hydro plants with a total of about 350,000 kw were added to the system. There are 38 dams still under construction, and the power plants of the 5 largest will provide more than 1 million kw of new capacity. Moreover, they are being built by construction methods and with construction equipment that will stack up with the most modern anywhere —lending assurance that they will be completed pretty much on schedule.

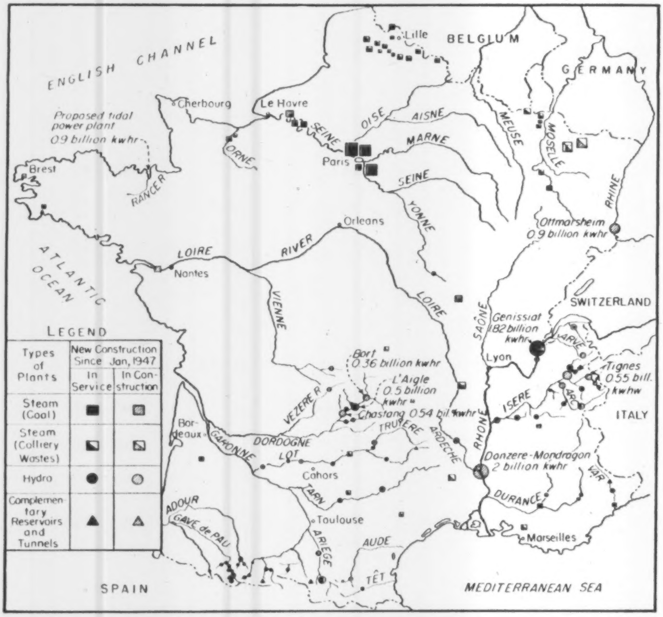
• ECA a Big Factor—In all of this advance, of course, America's ECA has played a vital and continuing role. Through grants of dollars with which France could buy needed equipment and materials—dollars that had to be matched in value by French appropriations of francs—the ECA provided the motive force that made the construction program tick.

An American viewing the French improvement is thus entitled to feel a certain satisfaction, although this feeling should stem from the fact that the novel idea of ECA is of American origin rather than that the American taxpayer footed the bill for a foreign gift. Whatever gift ECA has made has been largely returned to the American economy, since most of the dollars granted the French—and other ECA-aided countries—are being spent in the U. S., and thus turn up as wages, dividends and taxes.

The other important fact about ECA is that to get its dollars the French, in effect, have to buy them with francs that must be spent on wages and in purchasing local equipment and materials. It is this double-barreled effect of dollar grants and "counterpart funds" in francs that has given France's rebuilding program such an imposing push.

Just as a matter of statistics, ECA from its inception in 1948 up to Nov. 1, 1950 granted France procurement authorizations of slightly over $2 billion. (Great Britain received $2.7 billion, while the remainder of the $10 billion total outlay by ECA has gone in lesser amounts to the other 16 Marshall Plan countries). France has appropriated an equivalent sum in francs, and $760 million or 38% has gone into the power program.

• Other Evidence of Progress—Although the power program supplies the most striking evidence of France's physical improvement it is by no means alone in this respect. Neither highway or railway traffic is any longer


ENGLISH CHANNEL
BELGIUM
GERMANY
Lille
Cherbourg
Le Havre
Proposed tidal power plant 0.9 billion kwhr
Brest
RANCER
ORNE
SEINE
OISE
AISNE
MARNE
Paris
SEINE
MEUSE
MOSELLE
RHINE
YONNE
Orleans
Ottmarsheim 0.9 billion kwhr
ATLANTIC OCEAN
LOIRE
RIVER
Nantes
VIENNE
LOIRE
SAÔNE
SWITZERLAND
Genissiat 1.82 billion kwhr
ARVE
Lyon
Tignes 0.55 bill. kwhw
ARC
ISERE
ITALY
Bort 0.36 billion kwhr
L'Aigle 0.5 billion kwhr
Chastang 0.54 bil. kwhr
VEZERE R.
TRUYERE
ARDECHE
RHONE
Bordeaux
GARONNE
DORDOGNE
LOT
Cahors
TARN
Donzere-Mondragon 2 billion kwhr
VAR
DURANCE
ADOUR
GAVE de PAU
Toulouse
ARIEGE
AUDE
TÊT
Marseilles
SPAIN
MEDITERRANEAN SEA
LEGEND
Types of Plants
New Construction Since Jan, 1947
In Service
In Construction
Steam (Coal) ■ ▨
Steam (Colliery Wastes) ◪ ▧
Hydro ● ◎
Complementary Reservoirs and Tunnels ▲ △

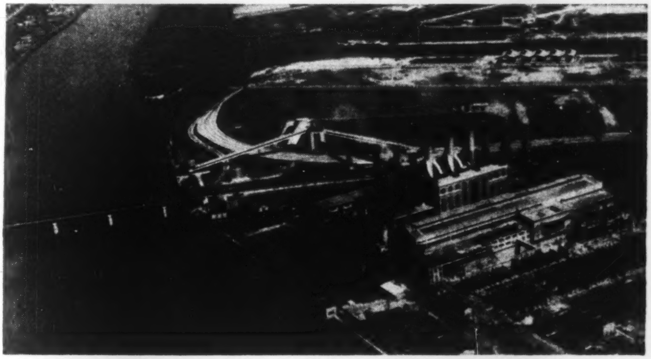
SOURCES OF FRANCE'S NEW POWER. Map locates steam and hydro stations completed since 1947 and those still under construction. Numerous other hydro projects (not shown) are in design stage. Output figures are given for the biggest installations.

hampered by broken bridges. Many of the new bridges, moreover, are of advanced design—a large number in prestressed concrete. At Rouen an elevated highway has been built over the rail tracks along the west bank of the Seine River, in which all of the girders are of prestressed design. And at Le Havre prestressed deck units for a long wharf are being precast in 90 ft lengths weighing 1300 tons each. They are slid onto a prestressed concrete barge, which moves them out into the river where they are discharged to be floated into place on previously-prepared pile foundations.

Throughout the Le Havre harbor area and in the town itself, new buildings are going up. Some are apartments for the bombed-out residents, and some industrial and office structures. One of the latter is a building to be occupied by American firms doing business in France and on the Continent.

Because rents are fixed at low amounts on all existing buildings in France, new structures cannot compete with them. As a result there is little construction of apartments to rent. All that is left is the possibility of building the cooperative-ownership type or else government-subsidized housing. Both such kinds of housing are being built, and activity is particularly noticeable in Le Havre and Rouen in the west of France and in Grenoble and Lyon in the east. Some building is also under way in the outskirts of Paris and in various parts of Marseilles, but generally speaking France's record of residential construction is as shameful as its dam and power plant construction is good.

POWER AT THE MINE HEAD. This is one of France's new steam plants—at Carling in Lorraine—which will burn waste products from the coal cleaning operations. The cooling towers are the largest ever built—193 ft in dia and 280 ft high.



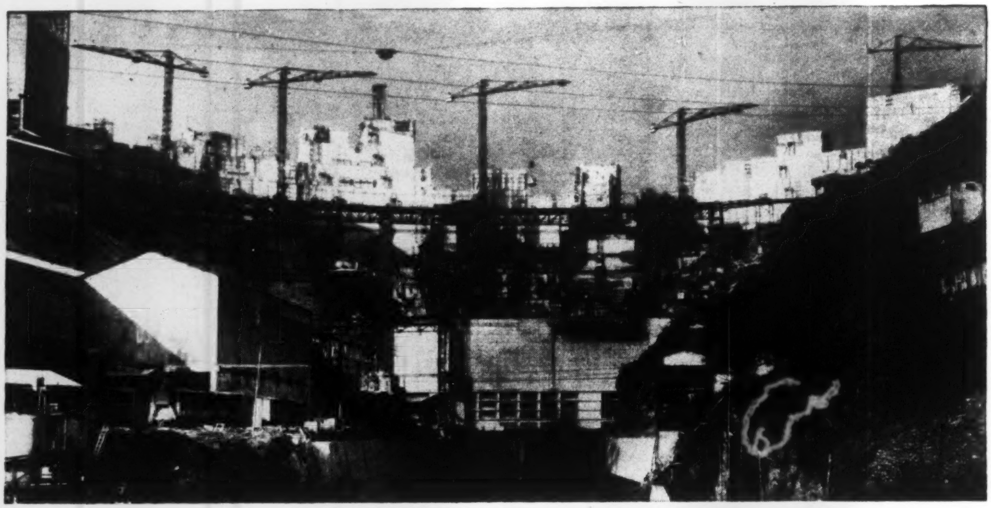
NEW PLANT INSIDE OF OLD. Badly damaged by bombing, the 200,000-kw Gennevilliers power station at Paris has been modernized by the addition of two 100,000 kw turbine-generators, five new boilers and a new coal storage and handling system. It will burn the expensive, washed French coal more efficiently.

• **Why a Power Program**—France's power program is based on the need to meet a consumer demand that is increasing at the rate of about 7% a year, and also on the desire to free the country from dependence on imported coal. Not only are the imports costly, but in wartime they cease almost immediately. In the last war the Germans put more French power plants out of service by cutting off the coal supply than they did by bombing. This is a fact the French do not forget even while urging the adoption of the Schuman Plan, which would make the coal and steel of Europe equally available to all the member countries.

To get away from imported coal the French have developed a power plan with several unique aspects. In the first place prime dependence is to be placed on hydro plants. This is possible because of an abundance of water (usually) and many steep water courses with numerous good dam and reservoir sites. Even before the war France had cut its dependence on coal to 50% of its power requirements by the construction of hydro plants. Actually it has not made much progress beyond this point of 50-50 division since the war, but this is because of the greatly increased demand for electric power coupled with a succession of dry years, which has made further construction of steam plants necessary.

It is in this latter development that the second unusual aspect of the power program appears—the building of steam plants at or near the coal mines to burn the waste screenings from the country's poor coal. These wastes—middlings, slurries and powder—total more than one-quarter of the total production. Until recently they have been of no value, but through the new power plant construction program as much as 10 billion kwh of energy—one-quarter of France's total requirements—will be supplied in 1952-53 by burning these waste products. In somewhat similar manner waste blast furnace gas from the steel mills will be used in a few power plants now under way.

Most of these colliery power plants are in the northern part of the country. For the plants around Paris, merchantable coal will still have to be used, but another part of the power program involves modernizing these plants so that they will burn coal more efficiently. The program is rounded



DAM IN THE MASSIF CENTRALE. Bort Dam on the Dordogne, largest in France (900,000 cu yd and thus slightly larger than Genissiat Dam), will complete major development of this stream whose annual power potential is on the order of 2 billion kwh.

out by the hydro plants concentrated in the south half of the country.

All of the plants—hydro and steam—are tied into a grid so that power may be moved to any part of the country where it may be needed. The efficiency of this arrangement was proved in 1949, one of the driest years on record. Despite the large additions that had been made to the hydro capacity, the output dropped from 14.8 billion kwh in 1948 to only 11.07 billion in 1949. But thanks to the colliery plants that had been built and to the ability to make their kwh available in short-power areas, steam-generated power output could be raised from 14.18 billion kwh in 1948 to 18.95 billion in 1949. Therefore, despite the poor showing of the hydro plants, it was possible to keep France's total power output moving forward—from 29 billion kwh in 1948 to slightly over 30 billion in 1949.

FOUR OF THE 45,000 precast concrete form units used in Bort Dam are inspected by the European chief of ECA's power division, George Sutherland.

It is perhaps also worth noting that the French power program since the war has been carried out almost entirely by the federal government through two national authorities—Electricite de France (for the hydro and merchantable-coal steam stations) and Charbonnages de France (for the colliery steam stations). Despite the multiplicity of administrative, financial and technical problems incident to taking over several hundred private power companies, EDF and CDF now operate with remarkable efficiency, according to ECA officials. Their record of accomplishment supports this contention (see table).

• Technological Changes—In so far as technical advancements are concerned, the most notable is probably the complete revolution in construction equipment that EDF brought about by embracing modern concepts not previously accepted in France. Faced with the necessity of moving 106 million cu yd of excavation, mostly on two jobs (Ottmarsheim on the Rhine and Donzere-Mondragon on the Rhone), it purchased several millions dollars worth of American earthmoving machines. Likewise, to place 8 million cu. yd of concrete, it went to large central mixing plants and extensive distributing layouts involving cableways, hammerhead cranes and monorails. Tunneling equipment and methods were also modernized in order to cope with the 250 miles of tunnels, varying from 43 to 430 sq ft in section, which had to be driven to complete the program.

French dam designers have practically abandoned the conventional concrete gravity structure for arches and gravity arches. And rockfill and earthfill dams are on the drawing boards for some of the poorer sites, which are becoming increasingly numerous. Several of the new concrete dams feature the so-called ski-jump spillway, discharging high in the air, often from the roof of the power plant.

Low head plants (35 to 50 ft) are also being tried out, both because there are many prospective sites for such structures and because they

Four-Year Hydro Construction Accomplishment in France

	1947	*1948*	*1949*	*1950*
Concrete Poured (cu yd).	708,000	807,000	1,417,000	1,867,000
Excavation (cu yd)	2,667,000	3,334,000	8,667,000	12,000,000
Tunnel Advance (ft)	128,000	241,400	278,000	214,500 est.
Capacity Added (kw)	159,800	300,400	328,200	393,000
Power output (billion kwh)	12.96	14.80	11.07	16.17

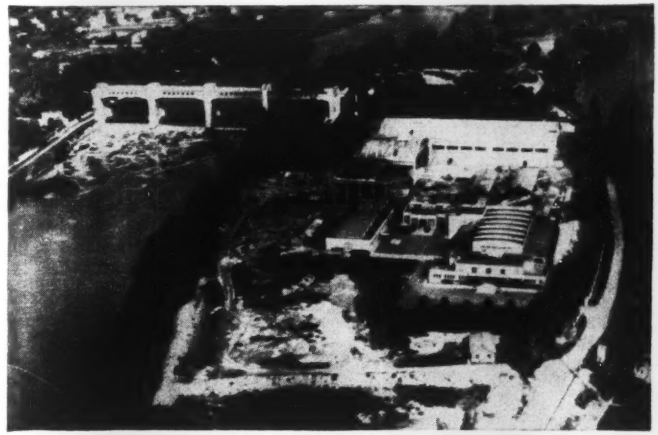
DAM IN THE ALPS. Construction of Tignes Dam on the Isere will provide water for the production of 600 million kwh annually as well as water for other plants to be built downstream. Rising 590 ft it will be the highest dam in Euorpe.

would be needed in any tidal power scheme that might be adopted. Studies are actively under way for one of the latter, for a location on the Rance River near St. Malo on the Channel Coast. It is estimated that it could produce 900,000 kwh annually. French engineers are not yet convinced that the Rance scheme is an economic possibility, but they are equally certain that if tidal power cannot be generated at this very favorable site that it is out of the question for any other spot in the world.

Finally, in speaking of technological developments, special emphasis should be placed on the program of hydraulic model research that forms a part of every project design. The French excel in this type of study, and there are two principal laboratories in which the work is concentrated. One, privately operated as a non-profit undertaking, is administered by the large hydraulic equipment manufacturers—Etablissments Neyrpic—at Grenoble. The second at Chatou—on an island in the Seine near Paris—is the National Hydraulic Laboratory, now operated by EDF and the Ministry of Public Works jointly. It is at present being improved by a large new building, which will permit many of the extensive outdoor models to be put under roof. About 300 ft square, the building will contain only 4 interior columns and will be equipped with all of the most modern apparatus for careful and productive study of hydraulic questions.

What France has accomplished and how—project by project—is told in English language editions of two French engineering publications published in January. One of these is *Travaux* available for $7 from Editions Science et Industrie, 6 Ave. Pierre Premiere de Serbie, Paris. The other is *La Houille Blanche* available for $7 from the publication offices, Boite Postale 41, Grenoble, France.

• Aspects of Hydro-Power Work— Broadly speaking the hydro program, although encompassing nearly all of the promising power streams in the country, presently centers on three rivers south of the middle of the country and on the Rhine. The project on the Rhine—Ottmarsheim—involves a 9 mile power and navigation canal paralleling the river, with a lock and powerhouse at the lower end, the latter to be capable of producing up to 1 billion kwh annually. The project is a duplicate of one immediately upstream at Kembs, built prior to the war, and of four more that are planned in progression downstream. Ottmarsheim has required 25 million cu yd of excavation and 893,-



HYDRAULIC LABORATORY. Construction of a building of three barrel-roof bays at Chatou laboratory near Paris will put big outdoor models under roof. The navigation dam in the Seine furnishes the lab about 10 ft of head, a great advantage for certain types of model studies.

CANAL APPROACH to the power house and 85-ft-lift lock of the Donzere-Mondragon project in the lower Rhone Valley.

000 cu yd of concrete of which a third is going into lining the canal with precast slabs fabricated by the vacuum process method. Navigation will be admitted to the canal early next year, and the first power production is scheduled a few months later.

The three rivers in the south on which the most important work is under way are the Dordogne, which empties into the Atlantic; the Rhone which empties into the Mediterranean; and the Isere, fed from the Alps, which empties into the Rhone.

Some idea of the magnitude of the possibilities on these rivers may be gained from the figures estimated for full development—2 billion kwh on the Dordogne in the Massif Centrale, of which slightly more than half is developed, with the remainder to be provided by two projects now nearing completion; 4 billion kwh on the Upper Rhone of which Genissiat completed postwar but pre-ECA (ENR June 24, 1948 vol. p 1024) provides nearly half; 10 billion kwh on the Lower Rhone of which one project now under construction—Donzere-Mondragon—will provide 2 billion; and 10 billion on the Isere of which 3.5 billion is under construction in 13 projects, with about half of this to be ready by 1954.

The important point about these three river systems is that the key projects on each are near completion.

On the Dordogne, Bort-les-Orgues dam will (1) regulate the output of stations downstream; and (2) provide 300 million kwh of power at its own plant. A gravity arch structure, it will be 394 ft high and 1,280 ft long. Its reservoir will have a capacity of 380,000 ac ft, and its power installation will consist of two 100,000 kw units, supplemented by a 35,000 kw unit of special design working under back pressure in the draft tube.

Tignes Dam on the Isere likewise is a regulating structure, and is being built on what is conceded to be the finest dam site in France. It will be 525 ft high, and provide a storage capacity of 190,000 ac ft. The annual power output is estimated at 600 million kwh from two stations. One of these is just downstream of the dam and will contain three 36,000 kva units. The second, connected to the reservoir by a 10-mile tunnel, will contain four 90,000 kva units operating under a 2,460 ft head.

The power plant of Donzere-Mondragon on the Rhone will contain six 50,000 kw units, of which two are now in course of installation to go into service next year. This large plant is only one element of a project whose compass and magnitude rival the biggest that have been undertaken in the U. S. Thus it includes a 17 mile long canal to feed the power plant and to serve navigation around a series of rapids in the Rhone. The construction of this canal, which is 475 ft wide at water level and 35 ft deep, has required the excavation of 65 million cu yd of material. At its upper end are three dams, one across the Rhone to divert water into the canal and two across the power and navigation openings to the canal to protect it from Rhone River floods. The drum gates in the Rhone River dam have a span of 148 ft, and are thus the largest yet built. Equally record-breaking is the ship lock in the canal adjacent to the power house. Its single lift of 85 ft is second only to the 92 ft that will be used in the McNary Dam lock on our Columbia River.

These three projects—Bort, Tignes, and Donzere-Mondragon—will be the subject of future articles in these pages.

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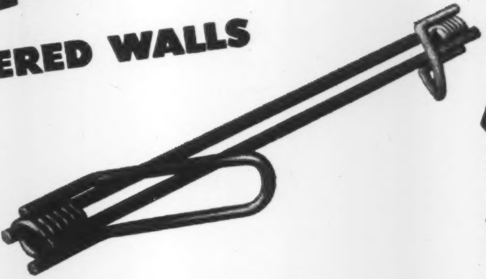

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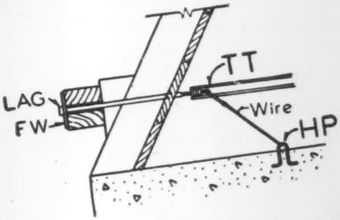
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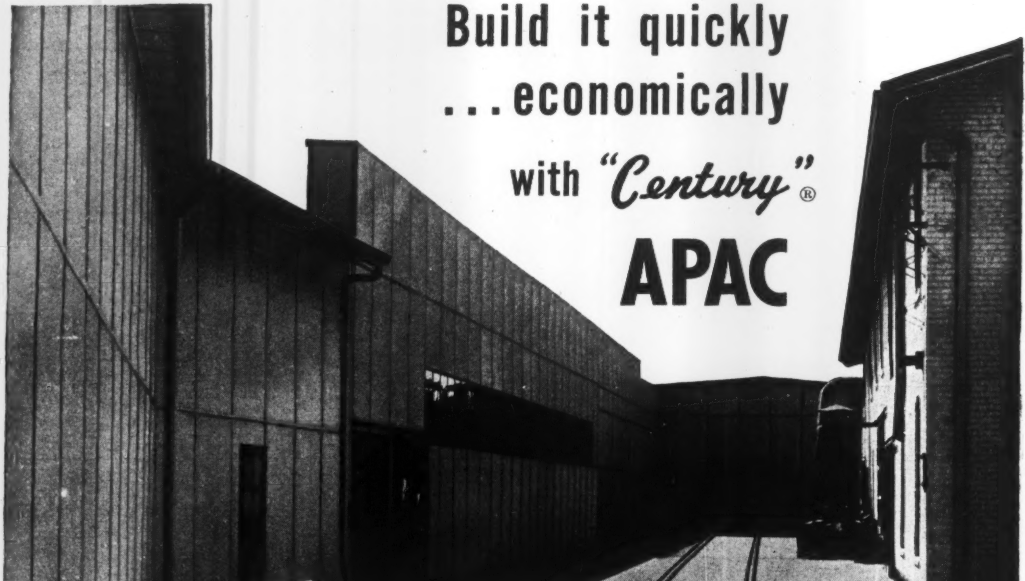

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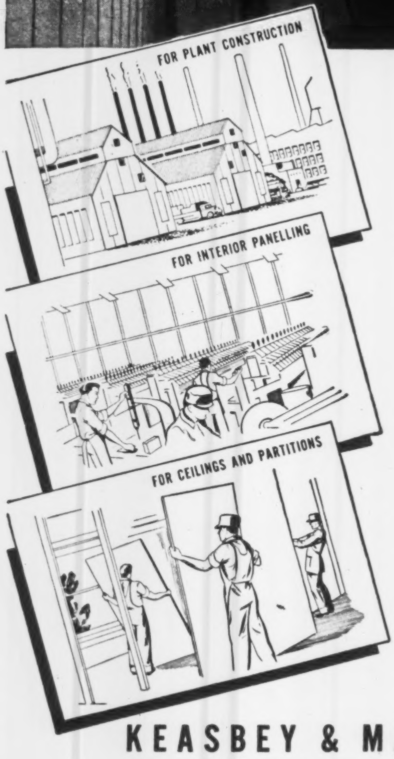

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What you should know about pozzolans

• They improve properties of green concrete
• They improve properties of hardened concrete
• They can save you money

Raymond E. Davis
Director, Engineering Materials Laboratory
University of California, Berkeley

Editor's Note: Some day soon, you will have to decide whether or not to use a pozzolan as an ingredient of your concrete. For certain kinds of work—and the list is constantly growing—these chemically active materials produce superior concretes. You should learn how to use them properly.

Pozzolans have a respectable history in the U. S. Cement for the Los Angeles Aqueduct (1910-12) was interground with a slightly active volcanic ash; and pumicite was employed in an experimental way in two dams of the Los Angeles Flood Control District in the twenties. But the real beginning of pozzolans in America dates from Bonneville Dam. Since that time—a dozen years ago—knowledge of these useful materials has greatly increased.

Most of the wisdom, however, is confined to a few experts. The great body of concrete users associate pozzolans with the laboratory—if they do not think of them solely as something the Romans used a couple of thousand years ago. This is unfortunate because pozzolans as a fourth ingredient of portland-cement concrete have an important place in modern construction —as witnessed by their current use both on Davis Dam and Hungry Horse Dam. To fill this information void, we asked Prof. Raymond E. Davis, perhaps the top U. S. expert on pozzolans, if a brief basic primer on pozzolans could be written. This article is the result of his cooperation.

ADDITION of a pozzolanic material to a concrete mix may bring about a considerable improvement in the quality of the concrete. When portland cement hydrates, calcium hydroxide is liberated. This chemical in itself contributes nothing to strength or watertightness and is readily removed by leaching. When a pozzolan is present, however, it combines with the calcium hydroxide, contributing both to strength and water-tightness.

Until less than two centuries ago, the only hydraulic cements were those composed of a mixture of pozzolan and lime. Present practice is to employ pozzolans in portland-cement concretes. The pozzolans may be either added at the mixer in finely divided form, or interground or blended with portland cement to produce portland-pozzolan cement.

• Composition of pozzolans—A pozzolan is a siliceous material. In itself, it possesses no cementitious value; but in finely divided form and in the presence of moisture, it will react chemically with calcium hydroxide to form insoluble compounds having cementitious properties.

While silica is the principal constituent of all pozzolans, most contain substantial quantities of alumina and iron oxide. It also appears that all good pozzolans contain a small percentage of the alkalies—sodium oxide and potassium oxide. In consequence, though the principal product of reaction between pozzolan and calcium hydroxide is considered to be a calcium silicate, it seems certain that there are formed other more complex compounds in which the constituents of pozzolan other than silica are involved.

The silica content of some of the best pozzolans obtained from opal may be as high as 90%; but other pozzolans (such as some of the fly ashes) which exhibit excellent performance in concrete, may have a silica content of no more than 40%.

The mineral structure of the silica in a pozzolan, however, is more important than its amount. Silica in amorphous forms (such as in opal and volcanic or artificial glass) reacts much more rapidly with calcium hydroxide than does silica in the crystal forms (such as in quartz, granite and other crystalline rocks). Thus, in a general way, pozzolan may be defined as a siliceous material containing a substantial portion of amorphous silica.

Pozzolans differ in their effect on the various properties of fresh and hardened concrete. Though there is much that is unknown concerning the chemistry of pozzolanic reaction, it is certain that the rate of reaction with calcium hydroxide is dependent on both the mineral composition and the fineness of the pozzolan.

• Types of pozzolans—Deposits of natural pozzolans are found principally in the West. These include glassy materials of volcanic origin, such as obsidians, tuffs, and pumicites, or volcanic ashes; and materials that are high in opal, such as diatomites, opaline cherts and shales.

Pozzolanic properties of many of the opaline materials may be improved by heat treatment or calcination. Also, some of the clays and shales, which in their natural state cannot be classed as pozzolans, may be rendered pozzolanic by suitable heat treatment.

Best of the artificial pozzolans, as well as the cheapest in the East and Middle West, are the fly ashes of high fineness and low carbon content that are derived from the burning of powdered coal in steam power plants. Some of these fly ashes are considerably finer than normal portland cement. Also, many of the glassy particles of low-carbon fly ash have a smooth and nearly spherical shape. These characteristics lead to a lower water requirement in concrete than for any of the other pozzolanic materials.

• Cement replacement—In comparing concretes with and without pozzolan, it is customary to regard the pozzolan as a replacement of a portion of the cement that would otherwise be employed. For example, a 25% replacement would consist of three parts of portland cement to one of pozzolan.

The optimum amount of replacement can be determined with certainty only by comprehensive long-time tests. However, the results of such tests are available for a considerable number of pozzolans, or classes of pozzolan. These data, together with results of short-time tests on a particular pozzolan, serve as a fairly reliable basis for selecting an appropriate percentage of replacement.

Optimum replacement depends upon the nature and fineness of the pozzolan, richness of the mix, type and fineness of portland cement, character and grading of aggregate and the properties of concrete to be improved.

For finely ground, uncalcined diatomite with air-entrainment—for general concrete construction—optimum replacement may be as low as 4 to 5%; for lean mixes of mass concrete as high as 12 to 15%. For calcined opaline shales and some of the calcined clays, optimum replacement in building construction might be as low as 10 to 15%; it might be as high as 25 to 35% for concrete pavements, 35% for reinforced concrete pipe, and perhaps 50% for some dams.

How pozzolans affect concrete

• **Bleeding and segregation**—Most pozzolans, when used as cement replacements in normal amounts, improve the properties of fresh concrete—plasticity, bleeding and segregation. Some of the finely ground opaline pozzolans are very effective, particularly for wet mixes and for concretes of low cement content.

This characteristic seems to be related not only to the fineness of the pozzolan but also to its mineral composition. For example, 4 or 5% of a diatomite with specific surface of 15,000 sq cm per gram may be more effective in promoting plasticity and in reducing bleeding and segregation than 15 or 20% of a volcanic ash ground to the same apparent fineness. Though 20% of a low-carbon fly ash may substantially improve the properties of fresh concrete, some pumicites of equal fineness lead to no improvement whatever.

• **Water requirement**—Use of a pozzolan as a cement replacement in normal amount generally leads to an increase in water requirement of concrete when the water requirement is based upon a given slump. This increase is generally greater for calcined opaline materials and clays than for volcanic glasses, such as pumicite.

In contrast, some fly ashes of low-carbon content, when replacing as much as 35% cement by weight, actually bring about a small reduction in water requirement, as determined by equal slumps—in spite of the fact that the absolute volume of the fly ash is substantially greater than that of the cement replaced.

• **Slump vs remolding effort**—In comparing concretes that contain pozzolans with those that do not, it appears that the slump test is not a valid criterion of relative workability.

Some opaline pozzolans greatly increase cohesiveness of concrete mixes, and such concretes with 1 or 2-in. slump may be just as easily placed by vibration as corresponding portland-cement concretes of 2 to 4-in. slump. The Powers remolding apparatus provides a much more reasonable measure of relative workability than does the slump test for these concretes.

Certain chemical agents that act to entrain air may reduce water requirement. They are much more effective with concretes containing some of the very fine pozzolans than with concretes containing straight portland cements.

• **Strength**—Concretes containing pozzolans in normal amounts are likely to have appreciably smaller compressive strengths at lower ages than corresponding concretes with straight portland cement. Other things being equal, the finer and more active the pozzolan, the more rapid the gain in strength at early ages; thus, the early-age contribution to strength is greater for finely ground pozzolans of opaline character than for the pumicites and fly ashes, which have a glassy structure and are not so fine.

If moisture is available, however, ultimate strengths of concretes containing coarser, less rapidly reactive pozzolans may equal or exceed ultimate strengths of concretes containing finer, more active pozzolans. This is evidently due to the difference in mixing-water requirement. Generally, at later ages, pozzolan-cement concretes exhibit compressive strengths close to those of corresponding portland-cement concretes.

It is also important to note that when a suitable water-reducing, air-entraining agent is employed with moderate amounts of some pozzolans, strengths of concretes at all ages may be greater than those of corresponding concretes containing straight portland cement without the agent.

Ultimate strengths of concretes of normal richness in which some of the very fine, low-carbon fly ashes have been incorporated may be substantially greater than the strengths of corresponding concretes containing straight portland cement. As a rule, pozzolans contribute more to the strength of lean or hard mixes than to rich mixes.

• **Drying shrinkage**—Quite often, concretes containing pozzolans shrink more upon drying than do corresponding concretes containing straight portland cement. For this reason, under severe drying conditions, concretes containing pozzolans may be expected to exhibit more shrinkage cracking.

Some of the concretes containing fly ashes of high fineness and low carbon content, however, are exceptions to this statement. Also, when a suitable water-reducing, air-entraining agent is employed with some of the pozzolans in concretes that normally exhibit high shrinkage, it has been found that the drying shrinkage may be no more—and in some cases is somewhat less—than that of straight portland-cement concrete without agent.

• **Weathering resistance**—Results of field observations and laboratory tests indicate that, under severe conditions of freezing and thawing, concretes containing many of the pozzolans in normal amounts are less resistant to weathering than corresponding concretes containing straight portland cement.

Exceptions are some of the low-carbon fly ashes, when used as cement replacements up to about 30%, and very finely ground diatomite, when used in an amount so small as not to increase appreciably the amount of water that is required by the concrete.

Significant improvement in weathering resistance of pozzolan-cement concretes may be obtained with suitable air-entraining agents. Recent investigations have disclosed that, for a number of air-entraining agents and pozzolans, weathering resistance may be several times as great as that of portland-cement concretes in which the same agents have been employed to produce the same quantity of entrained air.

• **Impermeability**—Use of pozzolans in appropriate amounts as cement replacements greatly increases watertightness of concrete. The coefficient of permeability for lean mixes at the later ages is generally only a small fraction of that for corresponding mixes containing straight portland cement.

At early ages, finely ground pozzolans of opaline character, such as diatomite and opaline shale, are much more effective in reducing permeability than are glassy materials, such as pumicite and fly ash.

• **Expansion**—Excessive expansion of concrete is sometimes produced by reaction between alkalies present in portland cement and certain forms of silica present in small amounts in many aggregates. It has been found that through the use of a suitable pozzolan in appropriate amount excessive expansion can be prevented. Perhaps nearly all pozzolans, if used in sufficiently large amount, would be effective in preventing such deleterious expansion.

The finer the pozzolan, the better.

Those that are high in opal, such as diatomaceous earths and opaline shales, are much more effective than those high in glass, such as pumicites and fly ashes.

• Sulfates and low pH waters—A suitable pozzolan used in appropriate amount substantially increases resistance of concretes to sulfate attack, as compared with corresponding concretes containing Type I, Type II or Type III cement. Most effective are the pozzolans high in opal.

Also, in general, resistance of concretes to weakly-acid, or low pH, waters may be substantially increased with a good pozzolan as a replacement in the order of 25% or greater.

• Generated heat—Heat of hydration of any mixture of pozzolan and portland cement is less than that of the same weight of corresponding portland cement. The rate and amount of heat generation accompanying this reaction is dependent upon the character and fineness of the pozzolan. When a Type II cement is employed at 70 F, the heat generated by the pozzolanic reaction up to the age of 28 days is, on the average, about half as great as that of the cement which was replaced.

Pozzolans to use for best results

Pozzolanic materials that have been or are now being most commonly used in concrete construction include the fly ashes of the East and Midwest, and the pumicites, calcined opaline shales and calcined diatomites of the West. The fly ashes and pumicites are of such fineness as to make grinding unnecessary.

As a guide to effective employment of the more commonly used pozzolans, here are some of their important characteristics:

• Opaline shales and diatomites—When these are used in normal amount of replacement (20 to 30%), optimum results are obtained by calcining and grinding the pozzolans to high fineness. Proper calcination temperature depends upon the composition or mineral character of the material. For some of the opaline shales and low-grade diatomaceous earths, this temperature may lie between 1,400 F and 1,600 F. If higher temperatures are employed, the water requirements of fresh concrete decreases, but pozzolanic activity also decreases and resistance to fine grinding increases.

As normally processed, the calcined material is quite friable. It is easily ground to a specific surface of 10,000 to 12,000, as determined by the air permeability method.

Most easily ground are some raw diatomites. Ball-milled, these may exhibit a specific surface in excess of 20,000 sq cm per gram. When used in small replacements with a suitable air-entraining agent, they may improve strengths of concrete substantially at both early and late ages, as compared with portland-cement concrete containing the same agent.

• Fly ashes—In judging the suitability of a fly ash for concrete construction, there are two items of importance—fineness and carbon content. The higher the fineness and the lower the carbon content, the better.

Among American fly ashes, carbon content ranges from as low as 1% to as high as 30%, and specific surface ranges from as low as 1,500 to as high as 3,800. Quite often, fly ashes that are high in carbon are of low fineness. For general concrete construction, carbon content should possibly not exceed 7%, and specific surface, as determined by the air permeability method, should not be less than 2,500.

When fly ashes of low carbon content and high fineness are employed as cement replacements in the order of 20 to 30%, the concrete is likely to possess properties of ultimate strength, weathering resistance and drying shrinkage approximately equal to, and in some cases somewhat superior, to those exhibited by a corresponding concrete containing straight portland cement.

A specific case illustrates best the effect of fly ash in particular, and pozzolans in general, upon the water-tightness of concrete. At the age of six months, a 4-sack concrete with fly ash as a 30% replacement had a permeability coefficient only one-fifth as great as that of a corresponding portland-cement concrete. The coefficient was only one-twelfth as great with fly ash as a 50% replacement.

Unfortunately, only a few power plants at present produce fly ash of desirably high fineness and low carbon content, but there are a few that yield a relatively coarse fly ash of satisfactorily low carbon content. For jobs where transportation costs are low, it seems entirely reasonable to use such coarse fly ashes with a coarser than normal natural sand. The coarse fraction of the ash should be regarded as a substitute for fine sand and the fine fraction of the ash as a cement replacement.

The largest single job in which fly ash has been employed is Hungry Horse Dam, a project of the U. S. Bureau of Reclamation in Montana. Here its use led not only to substantial improvements in quality of the structure, but also to a very large saving in cost.

• Pumicites—With respect to fineness and pozzolanic activity, pumicites vary greatly from deposit to deposit. Generally, pumicites, and other pozzolanic materials of similar origin, are not improved by calcination. Concretes containing pumicite shrink more upon drying and without purposeful air-entrainment are likely to offer somewhat less resistance to the action of freezing and thawing than corresponding concretes containing straight portland cement.

For the better pumicites, the rate of pozzolanic reaction is about the same as that of fly ashes of low carbon content and high fineness, but water requirement of the concrete is substantially greater.

Pumicite in larger amounts of replacement greatly increases watertightness of concrete at later ages; hence, it is suitable for hydraulic structures. Even at later ages, however, concretes containing pumicite are likely to exhibit somewhat lower compressive strengths than do corresponing concretes containing straight portland cement.

Pumicite and related materials, such as volcanic tuff, have been used principally in the West—for sea walls, dams, canal linings and concrete pipe. Largest single job in which pumicite was employed was Friant Dam, a U. S. Bureau of Reclamation project in California.

• Calcined opaline shale—The raw shale is found in a number of deposits along or near the coast of California. It is exceedingly active.

As a 20 to 30% replacement, the calcined product greatly enhances properties of fresh concrete, particularly in lean mixes. It prevents expansion due to alkali-aggregate reaction, promotes satisfactory strength at all ages and contributes greatly to watertightness, even at the early ages. When used in substantial amounts, it increases the drying shrinkage of concrete—and here lies its disadvantage relative to straight portland-cement concrete.

This material appears to have been employed first in this country as an ingredient of a commercially produced portland-pozzolan cement. It has been quite widely used in many types of concrete construction since about 1930.

As a separate material introduced at

the mixer, this shale has been applied in the construction of Davis Dam, a U. S. Bureau of Reclamation project on the Colorado River. It is being produced by a Southern California cement company, which calcines it at a temperature between 1,400 F and 1,600 F and grinds it to a specific surface of about 13,000. It is commercially available and is being employed on other work, particularly in regions where local aggregates are of doubtful quality.

This pozzolan was selected for Davis Dam principally to inhibit alkali-aggregate expansion. There the job strengths were as high as those for comparable mixes containing straight portland cement.

The East Bay Municipal Utility District, Oakland, Calif., is now using a calcined shale of similar characteristics. It is going into pipe and other structures of a large outfall sewer project serving several cities on the east side of San Francisco Bay.

• Calcined diatomaceous earth—Currently under construction is a large dam that is part of the Big Creek Development of the Southern California Edison Co. It is on the San Joaquin River in California. In the early stages of this project, a straight portland cement with purposeful air-entrainment was employed, but with poor results in lean mixes. Bleeding and segregation were excessive, and strength was not satisfactory.

Through the use of a calcined, low-grade diatomaceous earth as a 25% cement replacement, however, satisfactory strengths are being obtained. Bleeding and segregation have been largely eliminated, and the portland-cement content has been reduced from 4 to 2.8 sacks per cu yd.

• Other calcined materials—Results of research by the U. S. Bureau of Reclamation indicate that quite widely distributed through the West are a considerable number of shale or shale-like deposits that by proper heat treatment may be rendered suitable as pozzolans for concrete construction. Many cement companies are also investigating local deposits of promising materials.

Pozzolans available for commercial use

An ENR Research Staff Report

Sources of natural pozzolans are scattered throughout the U. S.

Clayey soils are the most widely spread of the pozzolans. Tuffs and pumicites follow second. Zeolites are found in only three states: Wyoming, California and Colorado. Diatomites and opaline cherts—the most desirable of all pozzolans—are spread throughout Washington, Montana, Nevada and California.

• Classification by activity type—To classify pozzolan sources petrographically is misleading because those within the same mineral class may vary widely in activity response. For this reason, the following table classifies pozzolans by one of each of its principal activity types.

Type I—Volcanic ashes and dusts—Included: rhyolite tuffs, pumicites, dacite tuffs and pumicites. These are glossy lavas and shallow intrusive igneous rocks containing a high proportion of acidic glass and owe their activity to volcanic glass with a refractive index ranging from 1.490 to 1.507. To achieve a proper fineness and particle-size distribution, all with the exception of a few naturally fine deposits of rhyolite pumicites require a high grinding cost.

Type II—Opaline cherts and diatomites—These are the most reactive of all activity types. Diatomites and diatomaceous earth particles are exceedingly fine and require slight grinding to break up aggregate lumps, and to lessen high water absorption. Opaline cherts possess the inherent chemical reaction of diatomites but are not so prone to high water absorption.

Type III—Clayey minerals—All require grinding to develop proper fineness. They must be calcined at temperatures ranging from 1000 degrees to 1800 deg F.

Type IV—Zeolites—These have a high water absorption. The altered zeolite tuff is inadequate for control of alkali-aggregate reaction and in some mixes, expansion due to this reaction is increased. Calcination to 1,400 F improves activity.

• A new development—Wollastonite, a calcium meta-silicate, white in color is being mined commercially in Willsboro County, New York. All natural sources of commercial importance are located in Kern County, California and Essex and Willsboro County, New York. Brittle, with a fibrous cleavage, it contains a metamorphic mineral associated with garnet in metamorphosed limestone. A hard, strong, dead white cement may be made by mixing with phosphorous acid, using boric acid as a set retarder, casting in flexible molds and firing at 2,200 F.

The major source of information for the following was a study of pozzolans that the Research and Geology Division of the Bureau of Reclamation has been making since 1933.

SOURCES OF NATURAL DEPOSITS

TYPE I—VOLCANIC GLASS

CALIFORNIA: Friant, Lake Bede near Constantia and Rio Junction, Mount Hoffman, Nomlaki, Tehama, Valley Springs
COLORADO: White River
IDAHO: Unidentified near Fayette
KANSAS: Ogallala
MONTANA: Bozeman
NEBRASKA: Ogallala
NEVADA: Panaca, Washoe County Lake Deposits, Volcanic deposits near Eccles, Unidentified near Boulder City
NEW MEXICO: San Antonio Peak Volcanics, Unidentified near Albuquerque, Unidentified near Folsom
OKLAHOMA: Near Hobart, Willow, Custer City, Cordell
OREGON: Mascali
TEXAS: Catahoula, near Houston
UTAH: Unidentified near Greenville
WASHINGTON: Ellensburg, Columbia River lavas near Elmore and Grand Coulee, Swank
WYOMING: Arikaree, Brule

TYPE II—OPAL

CALIFORNIA: Lake Bede near Cassel and Reno Junction, Monterey, Puente, Tequipie Canyon, Napa
COLORADO: Benton, Creede, Green River near Rifle, North Park, White River near Akron
MONTANA: Bozeman
NEVADA: Panaca
UTAH: Wasatch
WASHINGTON: Ellensburg, Ringgold

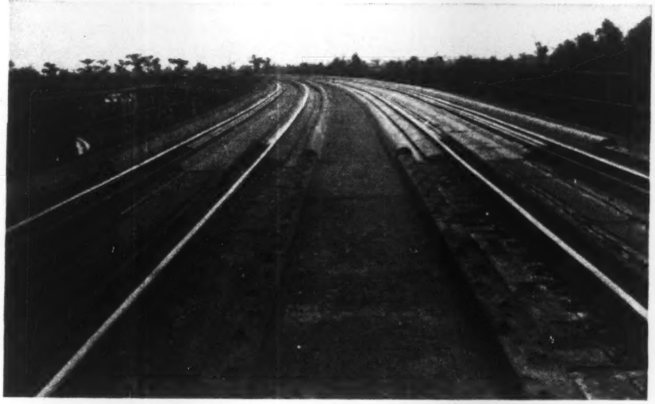
TYPE III—CLAY MINERALS

CALIFORNIA: Bottom sediments of San Francisco Bay near Redwood City, Ione, Monterey, Puente
COLORADO: Creede, North Park, Cochetopa Pass
FLORIDA: Unidentified near Inkom
KANSAS: Unidentified near Chanute
MONTANA: Bozeman, Flathead
NEVADA: Panaca
NORTH DAKOTA: Tongue River

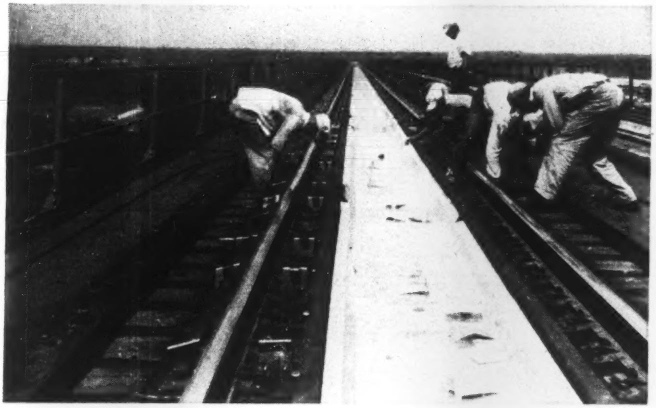
TYPE IV—ZEOLITES

CALIFORNIA: Rosamond
WYOMING: Frontier, Missouri Butte—intrusive Mississippi Butte

• Cost of Pozzolan—Chicago fly ash for the Canyon Ferry Dam in Montana totaled 22,600 tons and cost $1.40 per ton fob cars at shipping point. Thirty thousand tons of California calcined shale used at Davis Dam in Nevada-Montana cost $11.00 per ton fob cars at shipping point. Cachuma Dam, in California, is using 2,800 tons of California burned oil shale at $14.26 per ton. Texas pumicite in a quantity of 12,500 tons at $10.92 per ton is being used for the Falcon Dam in Texas-Mexico.



OLD AND NEW DECK PROTECTION on the Huey Long Bridge near New Orleans. In the foreground is the old galvanized steel protection for the timber railway deck and beyond is the new aluminum covering now being applied.



GREATER PROTECTION for the rail fastenings will be provided by the new design of the new deck covering, which will be supported above these fastenings by aluminum "chairs" instead of being applied directly to the tie surface under the rails as before.

Aluminum roof for bridge deck

PROBABLY the hardest battle that galvanized sheet steel has had to fight with the elements in recent years has been one under severe operating conditions on Louisiana's Huey P. Long Bridge.

That structure which carries rail and highway traffic over the Mississippi River near New Orleans, was completed in 1935, having been built jointly by the New Orleans Public Belt Ry. and the State Highway Department.

Its double-track rail deck is 4.35 miles long. At the time of construction this deck was covered with galvanized steel sheets to protect the timber crossties from hot ashes, hot fire bricks or hot brake shoes that might fall from passing trains and to protect the tops of the steel girders and beams from brine drippings.

Inspection of the deck in 1943 revealed that the galvanized sheets would have to be replaced in a few years. Consequently, the railroad company engaged the consulting firm of Modjeski and Masters, designers of the bridge, to recommend the materials and methods to be used in replacement.

The company specified that in addition to providing protection against fire and corrosion the new deck covering should be designed to facilitate inspection and removal of both rails and ties. Also, the new deck cover had to be in units that could be assembled easily on the high structure without special metal-working equipment, so that there would be a minimum of interference with regular rail traffic.

Manufacturers of different types of sheet material were asked to furnish specimens for use as test panels, and service tests lasting 3 to 4 years were made. As a result, the designers selected aluminum sheets of a grade known as Alclad 4S, furnished by the Aluminum Company of America. These sheets are of aluminum alloy faced with pure aluminum.

The original deck covering, as will be seen in the adjoining picture, was laid directly on the crossties, except at the timber guard rails, which it covered, and under both the running rails and the steel guard rails. With that arrangement, the rails, tieplates and fastenings were exposed to brine drippings.

The new covering consists of a series of shallow troughs, laid between the rail and between the tracks, and a series of elevated plates supported above the rail fastenings by "chairs" made of aluminum plates screwed to the ties. One edge of these plates is under the head of the rails and the other overhangs the trough between the rails. Arched plates with edges overhanging the troughs cover the wooden guard rails. At 120-ft intervals are drain troughs running across the deck below its surface between a pair of crossties to carry the run-off to downsprouts. Plates are 8 ft 2 in. long, the 2 in. being for overlap.

The chairs and plates under the inner edge of the running rails are 0.081 in. thick; other plates are 0.064 in. thick. About 500,000 lb of aluminum will be required.

Replacement was begun in February, 1950, and will be completed about June of this year. It is being made part of a general tie resurfacing and rail renewal program. Tops of the resurfaced ties are coated with an asphaltic mastic before the plates are laid and mastic coated pads are inserted under the tie plates.

Regular track and bridge crews of the New Orleans Public Belt R.R. are doing the work under the direction of E. S. Garland, general manager, and E. L. Mire, chief engineer.

This account of the work is based on a more detailed description in December, 1950, issue of RAILWAY ENGINEERING AND MAINTENANCE and on data supplied by the Aluminum Company of America.

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BOOK REVIEWS

Wartime wage adjustment

THE WAGE ADJUSTMENT BOARD—Wartime Stabilization in the Building and Construction Industry. By John T. Dunlop and Arthur D. Hill. 166 pp. Harvard University Press, Cambridge 38, Mass. $3.50.

With wage stabilization once more upon us, an analysis of the Wage Adjustment Board and the stabilization experience in the building construction during World War II is certain to be of interest to engineers, contractors and others active in construction. The fact that one of the authors, Professor John Dunlop, is chairman of the National Joint Board for Settlement of Jurisdictional Disputes in the Building and Construction Industry and in addition, one of the three public members of the newly constituted Wage Stabilization Board, indicates the authoritative nature of the book.

Dunlop and Hill review the record of the Wage Adjustment Board from the time that it was established in 1941 as a board of review under the aegis of the Office of Production Management (the Knudsen-Hillman predecessor of the War Production Board), through its middle phase as an agency of the War Labor Board, and its final period until February 1947, when it was the only WLB agency voluntarily retained in existence in the early post-World War II years. At first representatives of the procurement agencies sat on the adjustment board in addition to labor, industry and public members. Later, it was reconstituted and the procurement officials were dropped.

Labor and management played a more decisive role in policy formation and in day-to-day decisions on the Wage Adjustment Board than on any other WLB agency. This was especially true of labor. A former union president, who is again a union president, headed the Wage Adjustment Board, and union influence was strong enough to establish lower rates for non-union employers, thus hindering their search for labor.

The normal parties to collective bargaining in effect transferred their relationship to the WAB, with the result, according to Dunlop and Hill, that the reversion to more normal collective bargaining following the removal of controls was made more smoothly than in many other industries. The authors also assert that wartime experience resulted in more effective settlement of post-war disputes. It should be added, however, that it took compulsion in the form of the Taft-Hartley Act before the building trades unions were willing to establish effective machinery for the peaceful settlement of jurisdictional disputes.

This book analyzes and evaluates the work, policies and the decisions of the Wage Adjustment Board. Special attention is paid to the relation of the board to the Davis-Bacon Act. Throughout the book emphasis is upon the construction industry as a unique industry which must be treated differently from manufacturing enterprise. The authors explain the nature of the industry, the wage-making process within it, and the principal problems which confronted wage stabilization. They show how these problems were related to the economic, technical and collective bargaining relationship peculiar to the construction industry.

Both Dunlop and Hill served on the Wage Adjustment Board as public members and both are convinced that a special agency for construction wage stabilization is desirable. Certainly this industry has many unique problems. Nevertheless, it is not isolated from the rest of the economy. What is done about construction wages affects the wages of many other industries. The tendency of the members of the Wage Adjustment Board to consider only the problems of their industry had a disturbing effect on stabilization in other industries. From the point of view of the economy as a whole, the theory of special industry stabilization boards appears less desirable.—Reviewed by HERBERT R. NORTHRUP, Labor Economist, National Industrial Conference Board, New York.

On snow-melting systems

SNOW MELTING—By T. Napier Adlam. 224 pp. The Industrial Press, 148 Lafayette St., New York 12. $4.50.

This is a comprehensive progress report on a fast-growing use of embedded-pipe heating for pavements. The author has put in one brief text a thorough treatment of what has developed so far in the field.

Mr. Adlam characterizes the embedded-pipe method of snow removal as feasible, easy and efficient. First costs, experienced on present installations, vary, according to the author from $1.10 to $2.85 per sq ft—depending on the rate of snowfall the system is designed to melt. Costs figure at 6¢ per hour per 1,000 sq ft of pavement area as the price of melting a heavy fall of snow.

Information on snow—its amount, rate of fall and density—is given for various locations at various temperatures. From these data, heat required is calculated, (with examples) and a step-by-step design procedure is presented. Pipe spacing and sizes necessary for given heat requirements are presented on charts. Antifreeze solutions, automatic controls, pumps, boilers and heat exchangers are discussed.

When materials yield

THEORY OF FLOW AND FRACTURE OF SOLIDS, Vol. I—Second Edition, by A. L. Nadai. 572 pp. McGraw-Hill Book Co., New York, Toronto and London. $10.

THE INELASTIC BEHAVIOR OF ENGINEERING MATERIALS AND STRUCTURES—By A. M. Freudenthal. 587 pp. John Wiley & Sons, New York; Chapman & Hall, London. $7.50.

Both books present latest concepts of the behavior of engineering materials, in and beyond the elastic range, when subjected to forces. Effects of time and temperature are also taken into account.

The texts represent well advanced steps toward a description of strength of materials beyond the elastic range by the methods of mechanics of materials—toward obtaining exact definitions and treatments comparable to those on which the mathematical theory of elasticity is based.

To accomplish their aim, both authors define a relatively few ideal substances for which properties are clearly defined. They then analyze the behavior of these materials as forces, time and temperature are varied, hoping that the theories will yield results closely in accord with the actual behavior of certain real materials.

Freudenthal attempts to explain (or predict) performance of stressed materials from considerations of their internal structure. For this, it is necessary to know the laws of formation of materials from atoms, ions, molecules and crystals, and the response of these elementary building blocks to applied load. These laws are concerned mainly with the inherent mobility of the constituent particles and with the forces of interaction between them at the different levels of aggregation. Combining this approach with results of large-scale studies, Freudenthal presents an integrated picture of the action of engineering structures under applied forces.

In contrast, Nadai relies chiefly on

characteristics that can be obtianed by normal material-testing methods. His book is the first of a two-volume revision of his pioneering work, "Plasticity," published in 1931. Whereas the previous edition contained only a treatment of the plastic deformation of solids, this volume has a broader scope: a survey of the general conditions causing fracture. It presents also results of recent valuable experimental investigations of the yielding and fracture of ductile materials under combined stress. Vol. II will cover flow of metals under concentrated pressure.

Neither book is easy reading. This is due not so much to the higher mathematics involved—including some differential equations and tensor analysis—as it is to heavy language. Nevertheless, engineers will find it well worth while to struggle through at least one of them.

Miscellaneous Notes on Booklets and Reprints

Construction Job Management information that is available to contractors and engineers in this country in published articles and books has been made the subject of Bibliography No. 8 of the Engineering Societies Library. Its title is "Bibliography on Management of Construction Jobs." Copies can be obtained from the library at 33 West 39th St., New York 18, N. Y., for $2.00.

Soil Compaction Investigations made recently by the Corps of Engineers, U. S. Army, are summarized in five reports that can be obtained from the Waterways Experiment Station, Vicksburg, Miss. Report No. 1 covers compaction studies of clayey soils; No. 2 covers silty clay studies; No. 3 relates to sandy subgrades; No. 4 relates to natural, constructed and uncompacted silty-clay fill subgrades; and No. 5 relates to laboratory studies in connection with the CBR penetration test. Each sells for $1.00.

Water in Industry is the title of a survey published as the result of research undertaken by the National Association of Manufacturers and The Conservation Foundation, New York City. Based on responses from over 3,000 NAM members, this 51-page booklet presents chart-illustrated findings on how, and how much, industry uses water. Among the findings: about 75% of all the water use reported was used in only 5.4% of the plants reporting, which suggests that future studies be concentrated on the few real big users. These are listed as the electrical (power generation plus equipment manufacturing), pulp and paper, and petroleum industries. Also noted: industrial water use by the surveyed plants—existing over the '39-'49 decade—increased 36%; 50% of the plants use municipal supplies; 8.9% treat waste water.

New Engineering Books

Theory and Application of Electrical Engineering—By E. W. Schilling. 402 pp. International Textbook Co., Scranton, Pa. $6.50.

The Behavior of Engineering Metals—By H. W. Gillett. 395 pp. John Wiley & Sons, 440 Fourth Ave., New York 16. $6.50.

The Mathematical Theory of Vibration in Suspension Bridges—429 pp. Superintendent of Documents, Washington 25, D. C. Paper bound. $1.25.

The Water and the Power—By Albert N. Williams. 378 pp. Duell, Sloan & Pearce, 270 Madison Avenue, New York 16, N. Y. $4.50.

Electric Circuits for Engineers—By Edward K. Kraybill. 212 pp. The Macmillan Company: New York 11, N. Y. $3.85.

The Practice of Sanitation—By Edward S. Hopkins & Francis B. Elder. 423 pp. The Williams & Wilkins Company, Baltimore, Md. $7.50.

The Oak Ridge Story—By George O. Robinson, Jr. 181 pp. Southern Publishers, Kingsport, Tenn. $3.50.

Modern Building Inspection—646 pp. Building Standards Monthly Publishing Co. 124 West Fourth St., Los Angeles 13, Calif. $10.00.

Report Preparation—By Frank Kerekes & Robley Winfrey. 448 pp. The Iowa State College Press Ames, Iowa. $6.90.

Automotive and Construction Equipment—By C. W. Lindgren. 287 pp. C. W. Lindgren, Box 3620, Washington 7, D. C. $4.50.

Labratory Design—393 pp. Reinhold Publishing Corp., 330 West 42nd St. New York 18, N. Y. $12.00.

Electric Illumination—By John O. Kraehenbuehl. 446 pp. John Wiley & Sons, New York 16, N. Y., Chapman & Hall, London. $8.00.

A Water Policy for the American People—Volume 1, Report of the President's Water Resources Policy Commission ($3.25); Volume 2—Ten Rivers in America's Future—($6.00) Volume 3—Water Resource Law ($2.25). Obtainable from the Superintendent of Documents, Washington, D. C. for prices indicated. The commission's "Summary of Recommendations" also can be obtained for $0.15. Volume 2 is divided in sections relating to the Columbia, Missouri, Rio Grande, Colorado, Connecticut, Alabama-Coosa, Potomac, Ohio and Tennessee Rivers and the Central Valley in California, which are sold separately at prices ranging from $0.50 to $1.00.

Antifriction Bearing Design for Movable Span Bridges—A 63-page description of the bearings used in a number of movable bridges, prepared by the Bantam Bearing Division of the Torrington Company, South Bend 21, Ind. (Limited free distribution to bridge engineers.)

Reports and Pamphlets

Surface Drainage—Research Report No. 11-B, Highway Research Board, 2101 Constitution Ave., Washington 25, D. C. $0.90.

Highway Planning—Bulletin No. 31, Highway Research Board, 2101 Constitution Ave., Washington 25, D. C. $0.60.

Report Upon the Collection and Disposal of Refuse in the County Sanitation Districts of Los Angeles County, California, 2020 Beverly Blvd., Los Angeles 4, Calif.

One-Way Streets—Bulletin No. 32, Highway Research Board, 2101 Constitution Ave., Washington 25, D. C. $0.60.

Engineering Properties of Clay Soils—Bulletin No. 1, Winterkorn Road Research Institute, Princeton, N. J.

Development Plan for Patapsco River Valley Park—Publication No. 65. Maryland State Planning Commission, 100 Equitable Building, Baltimore 2, Md. $0.50.

Selected Bibliography on Highway Finance—Compiled by the Bureau of Public Roads. For sale by the Superintendent of Documents, Washington 25, D. C. $0.55.

Proposed Highway Toll Crossing-Richmond-San Rafael Bridge—Division of San Francisco Bay Toll Crossings, California Department of Public Works, Berkeley 4, Calif.

Highway Statistics—1949—Compiled by the Bureau of Public Roads. For sale by the Superintendent of Documents, Washington 25, D. C. $0.55.

READER COMMENT

Fit trucks to the road

Sir: I have been following with interest the Maryland Road Test being conducted by the Highway Research Board as reported in ENR.

The simple fact that there is sufficient concern to run a test of this magnitude is encouraging. However, it would appear that we are confining ourselves to a single approach to a problem that offers several avenues of solution.

It is difficult to visualize how this test will do more than verify that for existing trucks and highways the current load limit is justified. Certainly the preliminary reports point to this conclusion. Consensus of opinion then indicates that we must do one of two things: (1) limit the load or (2) build new roads like the New Jersey Turnpike for 36,000 lb per axle.

The fallacy of this approach is that it implies that we have reached the ultimate of perfection in the design of trucks and tires as well as the maximum knowledge of operating techniques involving speed as a function of the load.

As a side issue to the main problem we have been debating this subject with highway departments for many years, where it concerns the movement of construction machinery over the roads with axle loads in excess of 18,000 lb. For the most part there is a tacit agreement that big tires, low air pressures, slower speeds will move greater loads than ordinarily permitted without damage, and construction machinery on big tires moves under its own power by permit in a big number of states.

The point is, then, assuming this time that construction machinery gives a true indication of a different approach:

1. Can new tire and truck design be worked out to carry bigger loads over the same roads without damage?
2. Is the truck volume such that it is cheaper to build new roads or design new trucks or tires?
3. Or should both move halfway to meet in the middle?
4. From an operating viewpoint would higher load limits and lower speeds help to solve the problems of both roads and truckers?

Most engineering design concerns itself with two limits, a unit loading and a gross loading. It would appear that the highway problem would also benefit from such an approach, working up from pounds per square inch or linear inch of contact to pounds per axle and finally total weight of vehicle based on number of axles and overall length. A realistic investigation into types of springing, tires, air pressures, and speeds might well show that we could modify axle and gross loads upwards without redesigning our highways or pounding them to pieces.

Actually it is probably just as bad to take an arbitrary stand that the trucks should be fitted to the roads, as it is to demand the roads be fitted to the truck. It is undoubtedly true that we can use better roads, but in the economics of the problem it would appear that better results could be obtained by working both ends toward the middle.

D. K. Heiple
Chief Field Engineer
R. G. LeTourneau, Inc.
Peoria, Ill.

Next step for arches

Sir: The next logical development in concrete arch construction should be the application of techniques perfected in tilt-up construction and the techniques of erection of timber arches. There is no reason why concrete arches cannot be poured with the arch flat on the floor slab of the building with only side forms required. These arches could then be tilted and lifted into place. Erection stresses of course would have to be considered in detailing the reinforcing in the arch. It would also be logical to use precast slabs either of concrete or gypsum for the roof; even a timber roof could be used to eliminate the expensive formwork of an integral concrete roof. This construction would probably be lower in cost than the integral shell and arch roofs due to savings in falsework.

Construction of arches flat on the floor slab of either two-hinged or three-hinged types would be feasible. It would probably be easier to construct three-hinged arches with a steel hinge joint at the crown, since the unit to be cast and lifted would be smaller.

It takes an engineer and a construction man with vision and courage to tackle new forms of construction. It will be interesting to watch for the first engineer to undertake a major job of "tilt-up arches" comparable to the large integral concrete barrel roofs now built.

M. W. Jackson
Assistant Professor
Department of Civil Engineering
University of Colorado

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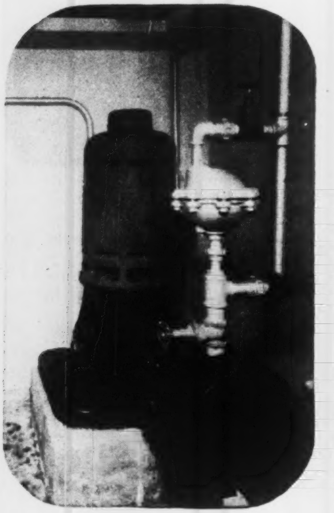

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MUNICIPAL AFFAIRS

BEAUTIFUL CAPITAL CITY—Nashville, one of the South's most attractive cities, is being made more so by the many new buildings now being or soon to be erected there, including a state office building and a state library.

New buildings change Nashville skyline

Nashville, capital of Tennessee, is undergoing a phenomenal change in its skyline. Building permits totaling more than \$50,000,000 were issued during the calendar year 1950. The 1950 population of the city is 173,359 and of Davidson County 320,388.

Major buildings now rising within the business district include the \$2,300,000 main office and service building for Nashville Electric Service—the municipal power facility; the \$1,000,000 Tennessee Theater; the \$2,000,000 Princess Theater and office building of the Crescent Amusement Co.; the foundations for the new \$5,000,000 Cain-Sloan Department store; the \$6,000,000 Federal Office Building, which will contain more floor space than any other office building in the state; the \$500,000 office building for the Southern Bell Telephone & Telegraph Co; and the \$1,000,000 publishing plant for the Newspaper Publishing Corp.

Other important changes will soon begin to show on the horizon, including the new State Office Building for which a contract has now been awarded in the amount of \$7,576,000. Bids are being taken on the new State Library Building, the cost of which is estimated at \$2,500,000. Later this year the state will take bids for a central heating plant to serve all state-owned buildings in and about Capitol Square.

Another large undertaking is the new bridge for vehicular traffic across Cumberland River, estimated to cost some \$5,000,000. The Tennessee Highway Department, in the fall of 1950, awarded a contract for the main river piers for this bridge and contracts for the remaining portions of the structure will be placed under contract just as quickly as designs can be completed and approved. Meanwhile the city of Nashville has engaged consulting engineers who are preparing plans for a boulevard which is to lead from this bridge around the east, north and west sides of the capitol, connecting all major highways radiating out of Nashville. This boulevard is to be constructed concurrently with the bridge and both will be dedicated as as a memorial to Tennessee World War II veterans.

No water to sell—The fast-growing suburbs of Toronto, Ont., which have been hoping to get more water from the city this summer, are in for a disappointment because the city has no water to sell. This report was made to the Ontario Municipal Board by A. U. Sanderson, chief waterworks engineer of Toronto. He said the city will be unable to spare any more water until the Parkdale plant comes into operation in two or three years, and this summer lawn sprinkling will be restricted.

DEVELOPMENTS ABROAD

FROM DAN TO BEERSHEBA—All over Israel there is a lot of building activity. Typical is this scene in Beersheba as new immigrants change that Biblical town (dating back to the days of Abraham) into a modern city. In the year ended last March 31, a total of 19,672 housing units were built in Israel to accommodate 60,000 newcomers who had been waiting in transitory camps. Many of the houses are of concrete, while a considerable proportion are prefabricated of wood. The government in its development budget for 1951 has made allocations for the erection of permanent homes for 150,000 newcomers. This program, together with that of the Jewish Agency, still falls far short of minimum requirements.—Eastern Pubs. photo

Big electric development for Rio Grande do Sul

Brazil's southernmost state of Rio Grande do Sul, lying against the borders of Argentina and Uruguay, is pressing forward an integrated electrical power generating and distributing system that within ten years should make nearly 150,000 kw of power available and represent a total investment of $108,850,000.

The development program is a prime necessity. Rio Grande do Sul has a population of 4,000,000, but the installed capacity of its public utility companies is only 80,000 kw, producing annually about 250 million kwh. This corresponds to 20 watts capacity and 62.5 kwh annual consumption per inhabitant, which is reduced to 14-watts capacity and 36 kwh annual consumption when the capital city of Porto Alegre is excluded.

There is, however, approximately 100,000 additional kw of capacity installed in private industrial plants, mostly in the interior of the state, with an estimated annual output of 150,000,000 kwh. This tremendous volume of private power generation points up one of the state's major problems in promoting industries—namely, that small industries are discouraged by the requirement that they have enough capital to build their own power supply.

To meet this problem, the state authorities decided on an integrated electrical development program, to use hydro-electric, diesel-electric and thermal-electric plants.

The project was divided into three stages. The first called for the construction of 16 small stations, the largest of which is a 10,800-kw hydroelectric installation. The second stage involves six large stations and 22 small thermal stations. The final stage calls for expansion of two of the larger stations.

Foreign briefs

Help for Lebanon—Col. Robert F. Herdman of Hardin, Mont., construction engineer for the Yellowstone division of the Bureau of Reclamation, has been named to direct a reconnaissance survey of irrigation and water power potentialties in Lebanon. The survey was requested by the Lebanese government under the state department's technical cooperation administration. Herdman conducted a similar survey in Korea last spring and his reports were filed, but the war prevented action on them.

Point 4 aid to Pakistan—A general Point 4 agreement has been made with Pakistan, which has also submitted to the U. S. requests for additional technical aid. When granted this would send several American technicians to Pakistan and bring many Pakistanis to this country for specialized training.

U. S. headquarters at Bonn—Construction of a multi-million dollar American occupation headquarters near Bonn is starting. It will overlook the Rhine and will house the U. S. High Commission offices now at Frankfort. It will be a complete American community—housing, offices, shopping center, etc. Counterpart funds will finance the project.

Big projects in Panama—At Almiranti work has started on the highway over the Cordilleras to Boquete, linking with the existing section of the Inter-American highway. This will give Panama its second transisthmian highway, the first one being the Boyd-Roosevelt highway paralleling the Panama Canal. The cabinet has approved a $25,000,000 project under which the Panamanian government would finance the construction of 8,000 prefabricated dwellings and resell them to individuals on terms up to 20 years.

Greek land reclamation—Engineers of Knappen, Tippetts, Abbett Engineering Co. of New York are beginning surveys for a reclamation program in several sections of Greece—to improve more than a million acres of crop lands in six Green river basins. It is an ECA project.

REPAIRING VICTORIA TOWER — About 66 miles of tubular scaffolding has been erected around this famous Westminster (London) landmark for the work of replacing and restoring the defective stonework of the 400-ft tower. The repairs started in 1938 and were interrupted by the war. It will take a year or more to finish them.—Combine Photo

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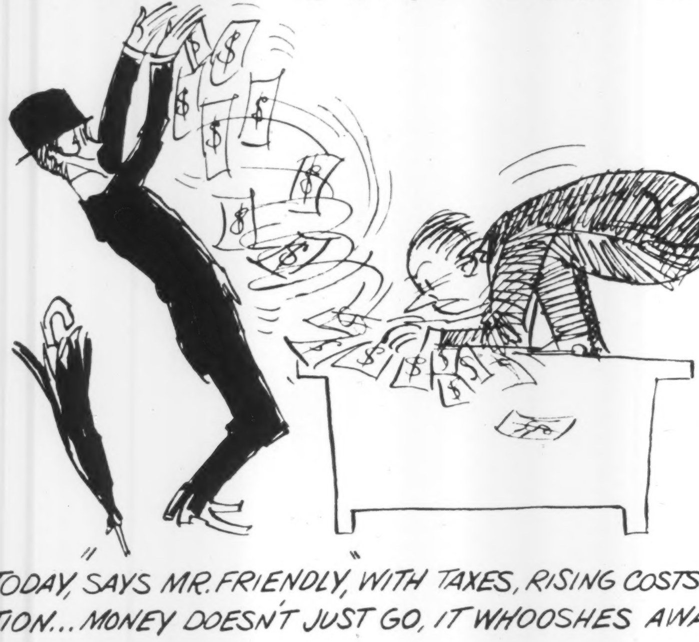

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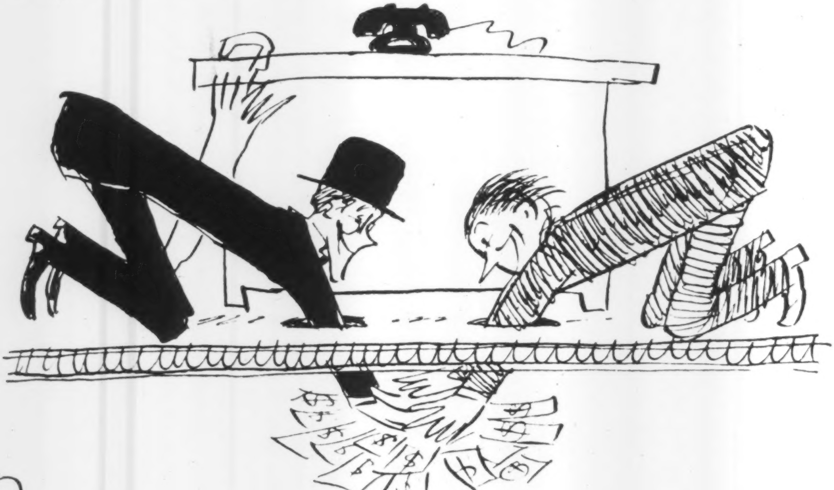

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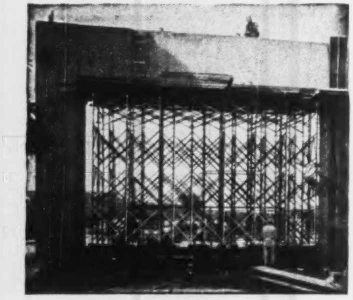

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MEN AND JOBS

Ralph G. Macy has been named director of public works for Connecticut. He is a registered professional engineer in Connecticut, New York and New Jersey.

Walter T. Brooks of Knoxville, former state highway engineer of Tennessee, has been appointed county engineer for Hamilton County, Tenn., at Chattanooga.

Robert E. Dunning has been appointed chief of the Laboratory Engineering branch at Los Alamos, N. M. He has been connected with the AEC since 1947. He was then a major in the Corps of Engineers.

Philip O. Macqueen has retired after 38 years of service with the Corps of Engineers. Graduated from Lehigh University in 1907, he was on water supply projects at the Panama Canal from 1908 to 1919. After World War I he worked for consulting engineers in Cleveland and in 1923 returned to Washington as assistant engineer for design and construction of the Dalecarlia filtration plant. Since 1936, he has been chief of the engineering branch of the Water Supply Division, Washington District Office, and has supervised designs for the current expansion program.

Howard A. Valiquette has been promoted from drainage engineer for the Montgomery County engineering department at Dayton, Ohio, to chief engineer. He replaced **Robert Eisenlohr,** called to active duty with the Air Force. Eisenlohr, a lieutenant colonel in the reserve, had been with the county engineer's office since 1936.

Alfred Yanda, Cleveland, Ohio, engineer who for the last three years has worked on traffic problems connected with the Innerbelt Freeway, has become a partner in the Verne Clark Engineering Co., Cleveland.

Paul H. Meyers has been appointed acting water superintendent at Walla Walla, Wash. He formerly was construction engineer in the city engineer's office there.

Thomas H. Dobbin, has been named road engineer of St. John, N. B. in succession to **E. B. Allan.**

Dale Granger, formerly engineer for the Landell Water and Sewerage District, has been named city sanitary engineer for East Lansing, Mich. He succeeds **Maurice Richmond.** He was graduated from Michigan State College in 1941 and served in the Army until 1945 as a lieutenant colonel. He next entered the employ of the State Stream Control Commission and has been with the Landell district since 1946.

W. L. Chadwick, manager of engineering, has been elected a vice-president of Southern California Edison Co. Chadwick, who has served as manager of engineering since 1945, will be in charge of engineering and con-

THE ASSOCIATED GENERAL CO

At the annual meeting of the West Virginia chapter, AGC, in Charleston, are, seated, left to right: G. W. Maxon, Dayton, Ohio, president-elect AGC of America; Col. Walter Krueger, Jr., U. S. district engineer, Huntington, W. Va.; Ray E. Ritchie, past president AGC of West Virginia. Standing, left to right, Road Commissioner Ray Cavendish; M. L. O'Neale, consulting engineer, and George W. McAlpin, state construction engineer, all of the State Road Commission of West Virginia; J. C. Cobb, Charleston district engineer, Bureau of Public Roads, and Harry Radcliffe, the commission's administrative assistant.

Capt. W. Orme Hiltabidle, Jr., CEC, USN, has been promoted to rear admiral. He was formerly chief inspector of the Bureau of Yards and Docks. Latterly he has been district public works officer in the 5th Naval District at Norfolk, Va. He was public works officer at the Pearl Harbor Naval Shipyard from 1941 to 1943, and supervised repairing of the yard after the Japanese attack. Between April, 1944, and July, 1945, as Officer-in-Charge of the 5th Naval Construction Brigade and Island Engineer for Guam, he supervised the planning and execution of a $300,000,000 base development program there.

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struction. He joined the company in 1922. In 1924 he became division engineer at High Sierra, and in 1928 went to the general office in Los Angeles as transmission engineer. From 1931-1937 he was engineer and senior engineer for the Metropolitan Water District.

Harry S. Riddell, engineer for the Southern San Joaquin Municipal Utility District of California, has resigned. He had previously been in charge of the Bureau of Reclamation office in Bakersfield.

Fred A. Rhodes has resigned as public works director for San Diego, Calif., to run for mayor. City Manager O. W. Campbell has appointed **E. W. Blom,** former assistant city manager as director. Mr. Rhodes has been with the city in various engineering capacities and at one time was city manager.

Royal W. Thompson, director of public works, Hartford, Conn., has resigned to become assistant to the president of the Holmes-Talcott Co. of that city, dealers in heavy construction equipment. He will continue temporarily as civil defense director. He is president of the Connecticut Association of Street and Highway Officials. His successor as head of the public works department will be **Charles W. Cooke,** assistant director, who was in the city's engineering department from 1914 to 1949.

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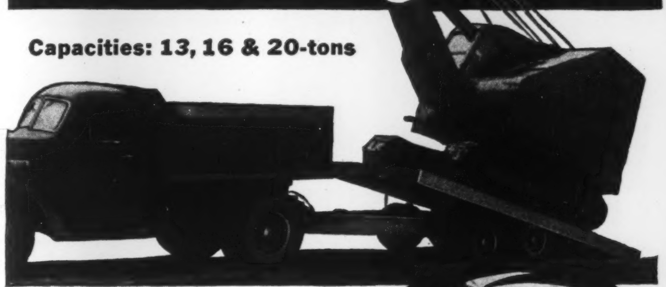

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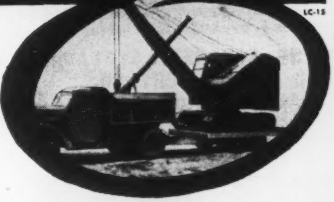

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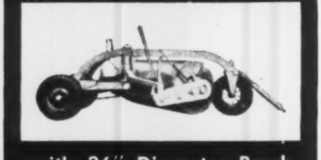

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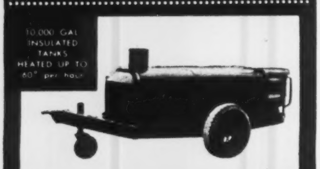

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EDUCATION and RESEARCH

To make survey of research facilities of all American colleges and universities

Plans for a survey to determine the potential for research in physical and engineering sciences in all American colleges and universities have been announced by Dean A. F. Spilhaus of the University of Minnesota, chairman of a sub-committee of the Engineering College Research Council.

Work is already under way, Dean Spilhaus said, on an extensive project to study the status of research facilities and personnel in over 1,000 schools. The Engineering College Research Council, he said, has the cooperation of the Research and Development Board, Office of the Secretary of Defense, in the undertaking.

The committee's report, due soon after April 1, will indicate the fields of research of particular interest to all institutions surveyed, their facilities, and the availability of personnel. Copies will be supplied to the Research and Development Board and, through it, to all military agencies concerned with contracting for the research services of colleges and universities. The findings will also be reported to the Atomic Energy Commission, National Science Foundation, and other federal and industrial groups.

The survey will report on available personnel and their special professional competencies, as well as on unusual equipment, at all educational institutions. The project covers civil and sanitary engineering, aeronautical engineering, astronomy, ceramics, chemical engineering, chemistry, electrical engineering, electronics, food technology, geology, industrial engineering, marine engineering, mathematics, mechanics, metallurgical engineering, meteorology mining engineering, oceanography, petroleum and fuels engineering, physics, psychology, and human resources.

The project is under the direction of the council's Committee on Relations with Military Research Agencies, of which Dean Spilhaus is chairman. Other members are Allan P. Colburn, University of Delaware; Dean W. L. Everitt, University of Illinois; Prof. F. B. Farquharson, University of Washington; Prof. C. W. Good, University of Michigan; Paul E. Klopsteg, Northwestern University; James S. Owens, Ohio State University; J. R. Van Pelt, Battelle Memorial Institute; and Eric A. Walker, Pennsylvania State College.

The Engineering College Research Council is a unit of the American Society for Engineering Education. Its chairman is Gerald A. Rosselot of Georgia Institute of Technology.

Use libraries first, urges ASEE

The more effective use of library resources in college study and research is being sought by the American Society for Engineering Education through a 7-man national committee headed by Edward A. Chapman, librarian of Rensselaer Polytechnic Institute.

As estimated 10 percent of research cost and time, Mr. Chapman says can be saved by adequate preliminary work in a library. The researcher, finding what others have done in his field, is saved from covering the same ground. Student use of libraries, while steadily increasing, is not enough.

Mr. Chapman's national committee is working through 16 regional groups made up of librarians and teachers from schools and colleges of engineering and science. A manual of library procedure for students and for researchers will be developed by the national committee on the basis of the regional studies.

New attitude on housing needed, say experts

A new approach to housing in the United States was called for by architects and designers at a recent conference at the Massachusetts Institute of Technology. Faced with the danger of bomb attacks in congested cities, they asserted that the old idea of "handmade, custom-built houses would have to go."

The solution is to approach the problem through research methods, rather than by the hit-or-miss techniques now employed. Probably this will lead to some of prefabricated, mass-produced houses.

Architect Richard Buckminster Fuller, Jr., pointed out that low-priced housing units can be manufactured that are easily assembled, taken down and moved about, and that allow for a comfortable standard of living when set up. Even if there is no threat of air attacks the need for redeployment and the high costs of building the conventional type of house, would soon force a demand for the mass-produced house.

Examples of such types of house were shown at the conference. Various units made of prefabricated sections were shown, including a large plastic dome, within which rooms and other living facilities can be set up. Another was a device that would make a house completely independent of waterpipes, gas mains, and electric power lines. It is called the "autonomous core." It was designed by Harold Horowitz, an MIT student. Running on fuel from a supply tank, the core is designed to take care of the power needs of a house. In addition, it contains a purification unit to which all waste water from baths, toilets, or garbage disposal is directed. Here the impurities are removed and left behind as solid matter while the water is returned to the system for reuse.

Brief News of education and research

Qualified students—A definite national policy on the selection of qualified students for technical training during the emergency was urged at the recent meeting of the Southeastern section, American Association for Engineering Education at Mississippi State College.

Prizes for theses—The Canadian Construction Association is offering three money prizes to students at Canadian universities for the best under-graduate theses dealing with a construction subject. Entries are welcomed from undergraduates in any Canadian university having engineering courses. The only condition of the prize awards is that $25 of each must be spent on technical books.

Ready-mixed concrete—At the recent annual convention of the Virginia Ready-Mixed Concrete Association a 3-day school on the problems of the industry was conducted at the civil engineering department of the Virginia Military Institute at Lexington. There were demonstrations on trial batches and the use of air-entrainment in the mixes.

Course on treatment—Plans are being completed for a 5-day course for operators of sewage treatment works in the New England area. It will be given by the New England Field Training Center at the University of Massachusetts at Amherst, and will be sponsored by the University of Massachusetts, the Massachusetts Department of Public Health and the U. S. Public Health Service.

Bargains
in
Bridges

566-foot bridge across Smith River in Douglas County, Oregon. Truss section fabricated by Timber Structures, Inc.

Permanent bridges needed to keep essential traffic moving are readily available in spite of certain material shortages. These are of engineered timber construction, fabricated by Timber Structures, Inc.

The bridge shown here is typical of this construction. It is an actual demonstration of how to build permanent, serviceable, trouble-free bridges on limited budgets. Here are the details of this job:

Bridge is 566 feet long overall, with truss section of 183 feet, and portal clearance of 15 feet. Clear width of roadway is 20 feet, with wearing surface of asphalt bituminous, supported by 2x10 laminations. H-20 loading. Truss chords are glued laminated Douglas fir members, preservative treated and joined to other bridge members with split ring connectors. Total cost of the bridge, including concrete piers, was approximately $150,000.

Five Basic Types of Engineered Timber Bridges

The bowstring truss bridge is only one of five basic types. Others are deck arch, girder, composite deck and parallel chord truss. All five types may be given any desired preservative treatment to protect them against attack by decay or termites.

These bridges are described and illustrated in a new brochure, "Permanent Timber Bridges". Your nearest Timber Structures representative has a copy for you; or you may obtain one by filling out and mailing the coupon below.

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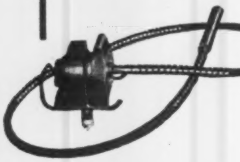

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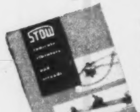

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MEETINGS

New officers of the Louisiana Engineering Society are: Harry P. Newton, president; John A. McNiven, 1st vice-president; Michael C. Abraham, 2nd vice-president; and John P. Fernandez, secretary-treasurer. At a recent meeting T. Keith Legare, executive secretary of the National Council of State Boards of Engineering Examiners, said that engineers should promote and direct legislation providing for comprehensive registration laws for the protection of the public and the engineering profession. Also emphasized by Legare was that members of state boards of registration should be nominated by professional engineers and supported against undesirable political influence.

Joseph E. Guill has been elected president of the Greensboro, N. C., Engineers Club, succeeding S. M. Sprowl, Jr. Other officers are: William Folk, vice-president; and J. H. Welch, Jr., secretary-treasurer.

New officers of the Oregon Technical Council, which combines the Professional Engineers of Oregon and the Oregon chapter of the American Institute of Architects, are: President, J. A. Corenbaum, representing the professional engineers; vice-president, H. L. Thompson, representing civil engineers; secretary-treasurer, E. W. Preston, representing mining engineers; directors, A. M. Runtiz, representing architects, and C. G. Tupling, representing mechanical engineers.

R. Marrett Wheeler is president of the Charlotte, N. C., Engineers Club. Other new officers are: Charles S. Reed, vice-president; John L. Rosenblatt, treasurer; and Glen R. Coan, secretary.

The Alabama Section of the American Society of Civil Engineers has elected J. B. Converse, president; G. P. Willoughby, 1st vice-president; S. W. Harbin, 2nd vice-president; and H. E. Myers, secretary-treasurer.

Thomas W. Coursey has been installed as president of the Rochester Chapter, New York State Association of Highway Engineers. Other new officers: William H. Saunders, vice-president; Paul H. Wright, secretary-treasurer; Russell Lewis, director; Sydney R. Towe and Marcus Levinson, delegates at large.

William Brewster of Charleston, retired district engineer for the United States Bureau of Public Roads, has been elected president of the West Virginia chapter of the American Society of Civil Engineers. Other officers are: R. C. Quinn, Keyser, vice-president; Kenneth Kettle, South Charleston, vice-president; and R. F. Baker, Charleston, secretary-treasurer. The new officers along with Past President Frank D. McEnteer of Clarksburg, comprise the board of directors.

Frederic G. Krapf has been elected president of the Delaware Chapter, Associated General Contractors of America. Other officers: P. S. Van Sant, first vice-president; John Dangel, second vice-president; Richard Raulston, third vice-president; Dominick M. Fontana, treasurer, and Francis E. B. McCann, executive vice-president and secretary.

Arnold F. Cayser of Livingston has been elected president of the newly-organized Montana County Surveyors association, formed to improve the status of county surveyors. Other officers are H. G. Young of Forsyth, vice-president; William Olson of Chinook, vice-president, and Carroll Maynard of Choteau, secretary-treasurer. Cayser said, "We have no steady income, no adequate retirement, no unemployment provisions, no bargaining power and no appeal board. Consequently, many counties do not have a county surveyor, whose trained services are required to build roads in these times."

CALENDAR

American Planning and Civic Association, McAllister Hotel, Miami, Fla., April 11-15.

Association of State Planning and Development Agencies, Sherry-Frontenac Hotel, Miami Beach, Fla., April 15-19.

Concrete Reinforcing Steel Institute, annual meeting, The Homestead, Hot Springs, Va., April 16-21.

Illinois Structural Engineering Conference, University of Illinois, Urbana, Ill., April 17-18.

American Society of Civil Engineers, Pacific Northwest Conference, Multnomah Hotel, Portland, Ore., April 27-28.

American Water Works Association, annual conference, Miami, Fla., April 29-May 4.

Materials Handling Exposition and Conference, International Amphitheater, Chicago, Ill., April 30-May 4.

California Sections American Society of Civil Engineers, The Ahwahee, Yosemite National Park, Calif., May 3-5.

Building Officials Conference of America, King Edward Hotel, Toronto, Ont., May 14-17.

Society for Experimental Stress Analysis, spring meeting, Wardman Park Hotel, Washington, D. C., May 16-18.

Pennsylvania Society of Professional Engineers, Americus Hotel, Allentown, Pa., May 18-19.

President's Highway Safety Conference, Washington, D. C., week of June 10.

OBITUARY

Charles S. Bennett, 59, assistant chief engineer of the Miami Conservancy Dist., at Dayton, Ohio, died March 10. He had been with the engineering organization of the district for 33 years. In 1919 he became engineer in charge of field surveys. Later he was in charge of the flood control work, collection of hydrological and hydrographical data, and supervision of flood warning and river stage predictions.

George H. Ferguson, 68, retired Canadian engineer, died in Ottawa March 16. He had been chief of public engineering division, Department of National Health and Welfare. At one time he was assistant to the chief hydraulic engineer of the Hydro Electric Power Commission of Ontario and hydraulic engineer for the Canadian Commission of Conservation.

Gordon B. Northrup, engineer, Belmont, Mass., died in Boston March 22. Educated at Wentworth Institute and M.I.T., during the last war he was chief engineer of a government project in the Bahamas.

Albert Wisnewsky, 62, superintendent of railroad construction for Morrison-Knudsen Co., Inc., died March 8 at Pendleton, Ore. He was long a superintendent and master mechanic for the company at Boise, Mont., and Salt Lake City, Utah.

Arthur R. Schulze, 67, former chief engineer of the U. S. Steel Co., in the Youngstown, Ohio, district, died March 21 in that city. As an engineer he was with the company for 44 years. He designed and constructed the strip mill at the McDonald Works.

Timothy J. Riordan, 55, retired Boston, Mass., civil engineer, died March 1 in Boston. He had been in the Boston city highway department 37 years, having retired Feb. 7 last.

Howard C. Waldo, 64, civilian engineer for the Army Quartermaster Corps, died Feb. 26 in Fort Myers, Fla., while on leave.

H. O. Nelson, 47, regional vice-president of Frontier Airlines, Denver, and a graduate civil engineer from Stanford University, died March 7 in Tucson, Ariz. Before forming Arizona Airways in 1943, he had headed several engineering enterprises, including State Development Co. in Los Angeles from 1928 to 1932, and the Nelson Engineering Co. in Los Angeles from 1932 to 1937.

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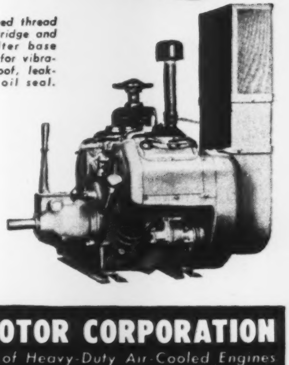
Replace Filter Cartridge after every 50 to 100 hrs. of engine service (depending on dust conditions) for the best engine protection. Ask your Wisconsin dealer for the new MICRO-FINE Oil Filter Cartridge.



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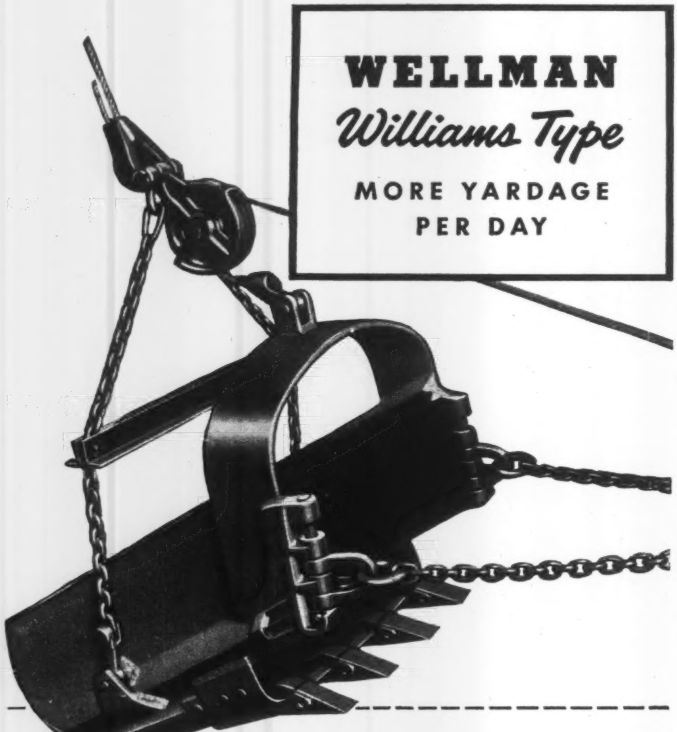

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(Since 1915)
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S. T. Burton Co., 228 N. LaSalle St., Chicago 1, Ill
George R. Lewis Co., 2036 Queen Ave. S., Minneapolis 2, Minn.
B. H. Mueller Co., 6625 Delmar Blvd., St. Louis 5, Mo.
Ole K. Olsen Co., 823 Perdido St., New Orleans, La.
Philip D. Barnard. 2036 Addison, Houston 5, Tex.
Western Steel Prod. Co., 1755 W. 13th Ave., Denver 4, Colo.

Edward T. Gibbons, 55, president of the Gibbons-Grable Co., Canton, Ohio, construction firm, which built many of the city's largest buildings, died March 4. He was a graduate of Manhattan College.

P. Ernest Wade, 62, a civil engineer and graduate of the University of Pennsylvania, died Feb. 18 at Philadelphia. He was special assistant to the secretary and business manager of the Philadelphia Board of Education.

Edward J. O'Brien, 65, superintendent of public works for Arlington, Mass., for 17 years, died there on Feb. 19.

Charles E. Carson, 87, Chicago contractor, died March 10. He founded and owned the C. E. Carson Construction Co., which rebuilt the Chicago avenue pumping station and constructed a portion of Lake Shore drive.

George H. Shearer, 65, Seattle district engineer for the Washington State Highway Department, died March 11 at nearby Kirkland. Graduated from Washington State College in 1913 with a degree in civil engineering, he engaged in railroad engineering before joining the highway department in 1919. He served successively as district engineer at Vancouver, Spokane and Seattle, and also as construction engineer at Olympia.

George B. Moulton, 42, a civil engineer of Wakefield, Mass., died March 13 at Melrose. He was in the Massachusetts Department of Public Works. He attended Pratt Institute in New York and Tufts College School of Engineering.

Guy W. Pinck, 68, retired N. Y. State commissioner of canals and waterways, died in Albany, March 13. He entered the State Department of Public Works in 1911 as a rodman on a road-surveying crew. He worked in Buffalo until 1915 when he was transferred to Syracuse as district engineer. He went to Albany in 1939 to head the Division of Canals & Waterways. He also had served as chief engineer for the State Flood Control Commission.

Tom Rowley, 48, of Cody, Wyo., Bureau of Reclamation engineer in charge of power line construction for the Big Horn district, was fatally injured in an auto accident near Thermopolis recently.

W. Tyrrell Sullivan, 66, a structural engineer for the Chicago Sanitary District for 18 years, died March 23. Formerly he was with the American Bridge Co.

MATERIALS AND LABOR PRICES

Market quotations on construction materials and wage rates reported monthly by ENR correspondents
May Materials, and Labor Prices will appear in May 10, 1951 issue

CEMENT, AGGREGATE, READY-MIXED CONCRETE—F. O. B. CITY

	PORTLAND CEMENT* Per bbl. C/L lots cash. dis. not deducted			SAND AND GRAVEL Per ton. carload lots			CRUSHED STONE Per ton. carload lots		CRUSHED SLAG Per ton. carload lots, f.o.b. plant		CONCRETE BLOCK 8 x 8 x 16-in.; truckload del.; per block		CONCRETE Ready Mixed 1:2:4, over. 50 c.y., del.
	Paper	Bulk	Mortar	Gravel, 1½ in.	Gravel, ¾ in.	Sand	1½ in.	¾ in.	1½ in.	¾ in.	Sand grav.	Lt. wgt. agg.	
Atlanta	$3.63	$3.35	3.10	$2.00	$2.00	$1.75	$2.10	$2.10	$1.65	$1.85	$0.186	$0.186	$11.00
Baltimore	3.64	3.34	3.30	2.50‡a	2.50‡a	2.00‡a	2.70‡a	2.80‡a	2.60‡a	2.55‡a	.17	.17a	10.80
Birmingham	3.11	2.68	2.82g	2.24n	2.24n	1.94n	2.50	2.50	1.10	1.30	.165	.165	7.85
Boston	3.92	3.61	3.55	2.50a	....	2.50a	1.50a	1.60a	....	....	.206	.22a	11.50h
Chicago	3.29	2.99	3.94	3.00‡b	3.00‡b	3.40‡b	3.00‡b	3.00‡b	2.00‡	2.00‡	.22	.22b	11.50
Cincinnati	3.46	3.18	3.16	2.00‡c	2.00‡c	2.05‡c	2.35‡h	2.35‡h	....	....	.21	.225a	10.95f
Cleveland	N. A. in C. L.		....	2.05ef	1.85f	1.65	3.65a	3.65a	2.85‡	2.85‡	....	.23	13.00g
Dallas	2.95	2.65	2.70	2.15	2.15	1.84	2.22	2.38	....	....	.125e	.215	9.30
Denver	3.89	3.64	3.89	1.85	2.00	1.20	....	....	....	....	.22	.255a	10.00
Detroit	3.25f	2.98	3.04	4.00‡b	4.00‡b	3.50‡b	4.00‡	4.00‡	4.00‡	4.00‡	.19	.20a	10.50f
Kansas City	3.30	3.03	3.15	1.90‡	1.90‡	1.50‡a	1.90‡a	1.90‡a	....	....	.23ag	.23c	10.95b
Los Angeles	4.00a	3.52a	4.72	2.10a	2.20a	1.95a	2.08a	2.08a	....	....	.11f	.225	10.50lhm
Minneapolis	3.68cd	3.37cd	3.33	2.40‡ag	2.40‡ag	1.45‡ag	2.50‡ag	2.50‡ag	....	....	.23ik	....	11.75fi
Montreal	2.66ac	2.51ac	....	2.50	2.50	1.90i	.85ij	1.10ij	....	....	.22	.20a	10.50ek
New Orleans	3.20e	2.80e	3.18	2.32	2.32	1.82	....	....	1.05	1.25	.25	....	12.90
New York	3.74	3.44	3.32	2.35bk	2.50bk	1.60bk	2.50bl	2.50bl	....	....	....	....	11.40an
Philadelphia	3.38/3.68‡	3.07/3.37‡	3.38‡	2.65‡	2.75‡	2.15‡	2.10‡	2.15‡	1.75	1.65	.22/.25	....	11.50
Pittsburgh	3.32	3.04	....	2.15‡	2.15‡	2.10‡	2.60‡	2.60‡	2.15	2.15	.23d	.23d	11.00
St. Louis	3.28/3.38b	2.94/3.10b	3.22	2.70am	2.70am	2.20/2.70am	1.70j	1.70j	1.25	1.25	.23i	.27ci	10.40
San Francisco	3.35	2.95	....	1.86	1.86	1.96	1.96	....	....	....	....	.26c	10.75c
Seattle	3.75a	3.25a	3.85	3.00‡bm	3.00‡bm	3.00‡bm	3.50‡bm	3.50‡bm	....	....	.24j	.3325j	10.95j

‡ Delivered. * Prices incl. dealers comm. except as noted.
CEMENT: a Subj. to 10¢ dis. b Less 2% for cash. c CL price dealers, comm. not incl d Dealers sell only LCL. e Plus switching charges. f Paying up to $3.80 for cement brought in from outside sources. g Warehouse pickup.
SAND, GRAVEL, STONE & SLAG: a Truck lots. b Per cu. yd. c 5 tons or more. e ½". f Pea gravel. g Less 5% for cash. h Less than 5 tons. i Sales tax incl. j F.o.b. quarry. k Barge lots asd. l F.o.b. scow Hudson river. m Less 2% for cash. n F.o.b. cars.

CONCRETE BLOCK: a Cinder. b Waylite. c Haydite. d Celocrete. e 5½ x 8 x 12 in. f 8 x 4 x 16. g F.o.b. truck at job. i Less 2% for cash. j Less 1% for cash. k 8x8x18.
READY MIXED CONCRETE: a 5 cu. yds. or over del. Man. b 25 cu. yds. or more. c 10-100 cu. brackets. e 2,000 lb. concr. f 2500 lb. comp. g Aver. haul 7-9 mi. zone. h Less 50¢ for cash. i 5% off for cash. j 2% off for cash. k Sales tax included. l 1:2½:4. m F.o.b. yard. n Plus escalator clause.

CASH DISCOUNTS CEMENT to Contractors: Truck delivery, 2% for cash on 10th of month; on carload deliveries, no trucking, same as dealer cash discount 10c. per bbl. for payment within 15 days of date of invoice. Subject discount 10c. per bbl. 20 days in Montreal.

CURRENT MAXIMUM PRICES AT CEMENT MILLS

Charge for bags not included. For paper bags add 30¢ per bbl., not refundable

	Bulk		Bulk		Bulk		Bulk		Bulk
Richard City, Tenn	$2.60†	Buffington, Ind.	$2.55†	Steelton, Minn	$2.65†	Muskegon, Mich	$2.70†	Toledo, O	$2.60†
Clinchfield, Ga	2.60†	Independence, Kan	2.50†	Leeds, Ala	2.45†	Saginaw, Mich	2.60†	Milwaukee, Wis	2.75†
Kingsport, Tenn	2.60†	Hannibal, Mo	2.55†	Duluth, Minn	2.65†	Wyandotte, Mich	2.60†	Green Bay, Wis	2.75†
West Des Moines, Iowa	2.65†	Northampton, Pa	2.60†	Hudson, N. Y	2.60†	Buffalo, N. Y	2.60†	Ironton, O	2.60†
Nazareth Pa	2.60†	Universal, Pa	2.65†	Alpena, Mich	2.50†	Oswego, N. Y	2.75†	Montreal City	2.31
Bath, Pa	2.60†	Waco, Tex. (+ 10¢ tax)	2.50†	Detroit, Mich	2.60†	Cleveland, O	2.60†	W. Winfield, Pa	2.65†

†*Prices to hold for second quarter of* 1951.

PAVING BRICK, BLOCK, ASPHALT, ROAD OILS—F. O. B. CITY

	PAVING BRICK AND BLOCK			PAVING ASPHALT Per ton, less than 80 penetration		ASPHALT BINDERS—FLUXES Per gal., 80-300 penetration		CUTBACK ASPHALT Per ton		ROAD OIL Per gal.	ASPHALT EMULSION (Quick-breaking) Per gal.	
	Granite Per M lots of 50,000 4x4x8 in.	Brick per M 3x4x8½ in. carload lots	Wood per sq. yd. 3½ in. 16-lb. treat	Tank car	Drums	Tank car	Drums	Tank car	Drums	Tank car	Tank car	Drums
Atlanta	$73.00	$35.00	$2.25	.....	....	.....	.....	.....	.....	.....	.....	.....
Baltimore	150.00‡	57.70‡	.....	$22.00	.....	$21.00v	$0.15	$.09w	$.17w	$.09i	$.09	$0.12
Birmingham	......	45.50i	.....	......	.....	.....	.....	......	......	......	......	......
Boston	......	......	.....	24.50a	$35.50a	21.00v**	35.50v**	.105a**	.17**	.085a**	.09**	.17**
Chicago	155.00‡	90.00‡b	4.50/4.60‡f	20.25b	30.25b	19.25bv	29.25bv	.0875bw	.16w	.075b	.....	.....
Cincinnati	.....	.....	.....	.....	....	.....	.....	.....	.....	.....	.....	....
Cleveland	150.00	55.00d	4.33g	26.50	38.50	26.50v	38.50v	.12w	.24w	.115	.14	28
Dallas	e	40.00	e	23.95	42.99	.1012	.1898	26.99	47.77	.0987	.1062	.1423
Denver	.....	48.00	.....	.....	....	.....	...	.....	.....	.....	.....	.....
Detroit	.....	90.00	.....	26.25	....	9.30v	.....	.1162w	.....	.092	.....	.215
Kansas City	e	e	e	18.55cl	17.55c	.....	.....	.0725cw	.075w	.0635c	.....	.....
Los Angeles	e	.....	e	15.50dm	15.50dm	15.50dv	15.50dv	17.00d	17.00d	16.00dv	.0825j	.1525j
Minneapolis	.....	.....	2.83h	26.50	36.50	24.50v	35.50v	25.00	35.50	.095	.1225	.2225
Montreal	137.00	e	e	27.00n	36.65n	16.70nu	18.70nu	16.30nu	18.30nu	15.20ns	.184ns	.225ns
New Orleans	.....	.....	.....	17.50e[1]	.....o	17.50ev	.....o	.08ew	.....o	.0882	.085	.....
New York	.....	.....	2.75f	25.50	28.02q	24.50v	44.04qv	.1040w	.1819qw	.1040	.1040	.1847q
Philadelphia	175.00	110.00	4.06	22.00*	....	22.00v	.....	.095w	.....	.....	.....	.....
Pittsburgh	165.00	48.00	4.60	22.00	36.00	.10	.20	27.00	39.00	.095	.09	.20
St. Louis	.....	.....	.....	19.25f	....	.1698	.....	.0865/.089*	.....	.15	.....	.....
San Francisco	.....	63.73c	.....	17.00g	32.50gp	17.50gkv	.....	19.00g	.....	17.50v	.085	.145
Seattle	.....	.....	.....	17.00h	37.50h	16.75hv	.....	19.50h	23.50hr	18.5 hv	.09h	.10h

‡ Delivered.
PAVING BRICK & BLOCK: a CL. b 3½ x 4 x 8½. c 2½ x 8½ x 4. d LCL, truck deliveries. e Not used. f 2" interior 6# treat. g 3". h 8# treat. i 3 x 3⅝ x 8½.
ASPHALTS: a Price at plant, Everett, Mass. b F.o.b. refinery, Lockport, Ill. c F.o.b. Sugar Creek, Mo. d F.o.b. refinery, El Segunda. e F.o.b. Baton Rouge. f F.o.b. Wood River or Roxana, Ill. g F.o.b. Richmond, Calif. h F.o.b. Martinez. i Bulk refinery. j F.o.b. refinery, Englewood, Calif. k 50–110 penetr. l Less than 100 penetr. m 40–80 penetr. n Tax incl. o Drums not avail. p Shipped in steel bbl. q Used drums. r In customer's drums. s Shipped in drums, per drum. u Per 100 gal. v Per ton. w Per gal. * Effective Jan. 6. 1. Effective Nov. 27, 1950. ** Effective Sept. 15, 1950.

IRON AND STEEL PRODUCTS—PER 100 LBS. BASE MILL PRICES

	STRUCT. SHAPES—PLATE	REINF. BARS billet	RIVETS ⅞-in. structural	SHEET PILING Base	STEEL RAILS Per Net Ton Standard	Light	Re-rolled	TRACK SUPPLIES Angle Bars	Std Spikes	Tie Plates	Track Bolts
Birmingham Area	$3.65	$3.70	$7.85	....	$72.00	$80.00	Not available	$4.70	$6.15	$4.50	....
Chicago Area	3.65	3.70	7.85	$4.45	72.00	80.00		4.70	6.15	4.50	....
Pittsburgh Area	3.65	3.70	7.85	4.45	72.00	80.00		4.70	6.15	4.50	....
Buffalo Area	3.70	3.70	7.85	4.45	72.00	80.00	....	4.70	6.15	4.50	$9.85
Cleveland	....	....	7.85	....	.....	.....	....	....	....	....	9.85
Youngstown Area	....	3.70	....	....	.....	.....	....	....	6.15	....	....
Geneva	3.65	....	....	....	.....	.....	....	....	....	....	....
Los Angeles	....	4.40	....	....	.....	.....	....	....	6.15	....	....
Pueblo	3.65	3.70	....	....	72.00	80.00	....	4.70	6.15	4.50	9.85

IRON AND STEEL PRODUCTS—F. O. B. WAREHOUSE, PER 100 LBS., BASE PRICE

	STRUCTURAL SHAPES Per 100 lb. base price	REINFORCING BARS Per 100 lb., base price u 5 tons to carload lot b New billet	Rail steel	Add switch	$/cwt for Del.	EXPANDED METAL LATHk Per 100 sq. yd., carload lots Std. diamond mesh. 3.4 lb.	Std. ribbed 3.4 lb.	WELDED FABRIC REINFORCINGd Per 100 sq. ft., carload lots 4x16 in., No. 5 & 10 wires	4x12 in., No. 8 & 12 wires	6x6 in., No 6 & 6 wires
Atlanta	$6.23	$6.05	$6.05	$.025	$.10	$31.50	$31.50	A.P.M.* Joliet, Illinois, Donora, Penn., $2.66 F.o.b. Mill: Monessen, Penn., $2.76	A.P.M.* Joliet, Illinois, Donora, Penn. $1.87 F.o.b. Mill: Monessen, Penn., $1.93	A.P.M.* Joliet, Illinois, Donora, Penn., $2.79 F.o.b. Mill: Monessen, Penn., $2.89
Baltimore	6.54	5.49l	....	....	.10	42.00	45.00			
Birmingham	5.70	5.75	5.75	.05	.15	47.00p	52.00p			
Boston	6.40k	5.80k	5.80kc	....	.10/.15	39.00	45.00			
Chicago	5.70	4.95ff	4.95ff	.0625	....	34.50‡	38.50‡			
Cincinnati	6.24kr	5.84r	....	....	....	38.50szee	41.50szee			
Cleveland	5.82	4.81v	....	....	.10	37.00‡	40.00‡			
Dallas	8.85	7.00	7.00	....	....	47.85	50.60			
Denver	7.20	7.10c	....	....	....	60.00s	72.00qs			
Detroit	6.09	5.59n	....	....	.10	53.00	58.00			
Kansas City	6.30nn	5.90#	5.90#	....	....	38.00	40.50			
Los Angeles	6.45fhh	6.15g	....	....	.15	48.00	54.00kk			
Minneapolis	6.06hh	7.32ll	7.32ll	....	.15	37.00	40.00			
Montreal	6.75i	4.75i	4.75g	....	....	44.10h	46.80h			
New Orleans	....	5.55ok	....	.05	.10	40.00	40.00			
New York	6.30r	6.25	6.25	....	.30	38.50st	45.00st			
Philadelphia	5.90k	5.95k	....	....	....	38.00‡	42.00‡			
Pittsburgh	5.40/5.60	5.40/5.60	....	....	.10	34.00	36.50			
St. Louis	6.03	5.34c	5.34c	....	....	47.00aa	53.00aa			
San Francisco	7.15ii	5.75l	....	....	.15	40.50	43.50			
Seattle	4.05e	5.35el	....	....	....	57.00smm	47.00smmx			

* At Producing Mill.

‡ Delivered. b 1–5 tons, add 35¢. Less than 1 ton, add 50¢. c 20 tons or over base. d Mill price plus freight. e F.o.b. plant. f Includes delivery in free delivery zone. g 10,000 to 39,999 lbs. h List price. Dominion tax exempt. Provincial and Municipal tax extra. i Plus Dominion, Provincial and Municipal sales tax. j Price per ton. k F.o.b. city. l Intermediate and hard grade, new billet. m Per sq.yd. n 5–10 tons. o 5 to 15 tons base. p Del. of 500 sq. yd. or more. q Std. ribbed. 4 lb. per sq. yd. r 5 tons or over. s LCL. t Asphalt coated. u Note: Revised size extra — 1 in., 1⅛ in., 1½ in., 10¢, ⅞ in., ¾ in., 15¢, ⅝ in., 25¢, ½ in., 50¢, ⅜ in. 80¢, ¼ in. $1.90. v 20 tons. Straight. w Copper bearing. x 2.5 lb. per sq. yd. y $0.0093 transportation tax included. z Copper alloy. aa Delivered truck to job. Contractor to do unloading. dd F.o.b. dock. ee F.o.b. cars. ff Carload lots. gg Including sales. hh 10,000-19,999 lbs. ii Rolled at Geneva mill. 400–999 lbs. kk ⅜" ribbed. ll 5 to 8 tons, f.o.b. city. mm 2% off for cash. nn 1–5 tons. # 10 tons to CL.

PLUMBING, HEATING, WATER, SEWER AND DRAIN PIPE

	C. I. PIPE Per net ton f.o.b. 6 in. to 24 in.	VITRIFIED SEWER PIPE Per foot, Delivered ASTM C13–44T std. 8 in. s.s.	std. 12 in. s.s.	24 in. ds.	36 in. ds.	CLAY DRAIN TILE ASTM C4–24 Per 1,000 ft., carload lots, f.o.b. 6 in.	8 in.	CONCRETE SEWER PIPE Per ft., delivered: ASTMC 14–41 12 in.	24 in.
Atlanta	$99.00	$0.43	$0.67	$3.39	$7.00	$114.00	$140.00	$0.45	$2.000
Baltimore	109.00	.539	1.0395	4.26	11.275	178.20	274.80	.90	2.45
Birmingham	93.00	.42	.75	2.99	....	210.00‡	375.00‡	1.25m	2.75m
Boston	113.00	.561uvx	.972uvy	4.71uvy	12.40uvy	181.80v	280.30v	1.55mg	3.80mg
Chicago	107.00	.65	1.25	5.10	13.50	150.00‡	270.00‡	.80	2.80
Cincinnati	106.00	.567	1.0935	4.455	11.685	154.80	239.70	.75m	2.80m
Cleveland	108.00	.462x	.891x	3.69x	10.04x	147.00	229.00	.80m	3.00m
Dallas	107.00	.436	.822	3.234	9.17	......	......	.49	1.60
Denver	115.00	.43dd	.74dd	3.18dd	....	......	......	.74m	2.50m
Detroit	108.00	.70	1.35	5.35	14.40	240.00m	360.00m	.80	3.20
Kansas City	106.00	.50	.88	3.50	....	216.70	......	.70	3.00g
Los Angeles	122.00	.54l	1.07l	5.24l	13.06l	228.20	348.90	.85	2.40ff
Minneapolis	102.86/112.00	.66mo	1.20mo	4.85mo	....	......	......	1.355h	3.85h
Montreal	100.00	.77z	1.35z	4.47z	7.23ez	......	......	72.00jkaa	218.00jkhaa
New Orleans	101.50	.496	.90	5.00	8.85*	251.00bb	441.00bb	.65	2.29
New York	111.00	.70	1.19	4.77	12.71	......	......	1.05	2.20
Philadelphia	110.00	.65	1.25	4.95	12.65	300.00‡	350.00‡	1.55h	3.75h
Pittsburgh	109.00	.386m	.752m	2.83m	7.622m	147.50	230.00	1.05h	2.50h
St. Louis	103.00	.51	.93	3.65	8.50	......	......	1.35il	3.00hl
San Francisco	122.00	.61d	1.20d	5.03d	12.57d	240.00dl	400.00dl	.95	3.20
Seattle	124.00	.51b	.91b	....	....	150.00c	......	.86ee	2.64ee

‡ Delivered. Based on existing freight rates; subject to rate change. Gas pipe and class A, $5 per ton additional. 4 in., $5 per ton additional, 30 in. and larger, usually $1 per ton less. b Extra strength ASTM C 200–44T. c 4-in., $90. d SS361-A. e 30 in. g Culvert pipe. Reinforced. ASTM C76–41. h Reinforced. ASTM C75–41. i Reinforced. ASTM C76–37. j Centrispun. k Per 100 ft. l F.o.b. plant. m Truck delivery. o Listed price is based on LCL (no minimum). p Less than 5 tons, per price per ft. t Within switching limits. u ASTM C13–40. v C.L. f.o.b. origin, freight allowed. x 2 ft. lengths. y 3 ft. lengths. z CESA A 60–1941 specifications used. aa No standard specification in Can. bb Freight allowed to destination in city. cc Truck loads; f.o.b. plant, Newton. dd LCL, delivered, f.o.b. truck. ee 1% off for cash. * Not stocked, only made to order. ff 21".

*WROUGHT STEEL PIPE

(Full standard weight)

Mill	2½ & 3 in., Butt Weld† Black %	Galv. %	3½ to 6 in., Lap Weld† Black %	Galv. %
Lorain, Ohio	43.5	24.0	....	....
Aliquippa, Pa.	43.5	22.5	36.5a	15.5a
Sparrows Pt., Md.	41.5	22.0	33.5a	13.5a
Benwood, W. Va.	43.5	24.0	38.0c	18.0c
Youngstown, O.	43.5	24.0	....	....
Indiana Harbor, Ind.	42.5	23.0	35.5a	15.5a
Sharon, Pa.	43.5	22.0	....	....
Wheatland, Pa.	43.5	22.5	38.5a	17.5a
Etna, Pa.	43.5b	21.0b	38.0cb	18.0cb
Fontana, Calif.	32.0b	18.5b	24.0ab	10.0ab

† Threaded and coupled. a 3½ to 4 in. b Continuous weld. c 5 and 6 in.

* WROUGHT STEEL PIPE: Discounts from standard list consumers carload prices. Base price approx. $200 per net ton. List prices per ft.: *Butt Weld:* ⅛ in., 5½¢; ¼ in., 6¢; ⅜ in., 6¢; ½ in., 8½¢; ¾ in., 11½¢; 1 in., 17¢; 1¼ in., 23¢; 1½ in., 27½¢; 2 in., 37¢; 2½ in., 58½¢; 3 in., 76½¢. *Lap Weld:* 3½ in., 92¢; 4 in., $1.09, 5 in., $1.48; 6 in., $1.92. Freight rates to destination to be added to price plus 3 percent tax on transportation.

WROUGHT IRON PIPE: List prices per ft. same as wrought steelpipe. Discount for Pittsburgh base. *Butt Weld* — 1 in. and 1¼ in. black, + 20.0, galv. + 48.0; 1½ in. black, + 14.0 galv. + 44.5; 2 in. black, 4 galv. + 34.5. *Lap Weld* — 2½ in. to 3½ in. black + 20.5, galv. + 47.5; 4½ in. to 8 in. black + 17.5, galv. + 43.0. Freight rates to destination to be added to name delivered price.

LUMBER, TIMBER, PLYWOOD—PER M FT., B.M., CARLOAD LOTS F.O.B.

SHORT LEAF YELLOW PINE AND DOUGLAS FIR

All S. L. Y. P. is No. 2 common or better and for No. 1 N. C. Box. (Prices in Bold Face)
All Fir boards, dimensions, planks No. 2, Fir small timbers and timbers are No. 1 Lengths up to 20 ft.
(Prices in italics)

LONG LEAF Y. P. Merchantable grade up to 20 ft.

PLYWOOD Rail freight increment (See note for base *price*)

	1x6 s4s	1x8 s4s	2x4 s4s	2x6 s4s	2x8 s4s	2x10 s4s	3x12 Rgh	6x12 Rgh	12x12 Rgh	Long Leaf 2x12 Rgh	Long Leaf 12x12 Rgh	Plywood ⅝"	Plywood ¾"
Atlanta †	$75.00	$78.00	$67.50	$69.50	$74.00	$78.00	$77.50	......	......	......	......	$22.32	$27.24
Baltimore *	91.50	94.50	75.00	89.00	80.00	85.00	90.00	......	......	$155.00	$152.00	22.86	27.90
	112.00g	*112.00g*	*112.00g*	*112.00g*	*112.00g*	*112.00g*	*113.50*	*$107.50*	*$107.50*	......	......	.....	.....
Birmingham †	83.00	83.00	70.00	80.00	83.00	85.00	95.00	......	......	115.00	130.00	21.78	26.58
	85.00	*85.00*	*75.00*	*80.00*	*80.00*	*79.00*	*85.00*	*85.00*	*85.00*	......	......	.....	.....
Boston *	94.00a	104.00a	92.00a	93.00a	94.00a	103.00a	......	......	......	......	......	22.86	27.90
³	*102.00*	*94.50*	*115.00*	*115.00*	*112.00*	*100.00*	*115.00*	*125.00*	*125.00*	......	......	.....	.....
Chicago **	106.00	108.00	95.00	98.00	98.00	106.00	110.00	......	......	140.00	140.00	18.72	22.80
	111.00	*111.00*	*115.00*	*112.00*	*112.00*	*112.00*	*115.00*	*115.00*	*115.00*	......	......	.....	.....
Cincinnati *	104.50	106.70	93.50	98.00	105.00	105.00	121.00	......	......	154.00	154.00	21.78	26.58
	125.50	*127.70*	*125.50*	*125.50*	*131.00*	*131.00*	*126.50*	*143.00*	*143.00*	......	......	.....	.....
Cleveland **	97.00	100.00	100.00	100.00	102.00	105.00	*130.00*	*130.00*	*130.00*	......	......	22.20	27.12
Dallas k†	78.00	80.00	69.00	58.00	59.00	59.00	98.00	......	......	108.00	98.00	18.72	22.80
Denver *	*Not in stock*		*128.00*	*130.00*	*131.00*	*131.00*	*137.00*	*156.00*	*156.00*	......	......	13.92	16.98
Detroit ‡	107.00	110.00	105.00	110.00	110.00	105.00	......	......	......	120.00	......	21.78	26.58
	103.00	*104.00*	*105.00*	*105.00*	*104.50*	*103.25*	*120.00*	*120.00*	*120.00*	......	......	.....	.....
Kansas City *	120.00	115.00	120.00	120.00	120.00	120.00	......	......	......	......	......	16.56	20.16
	120.00	*119.00*	*120.00*	*120.00*	*120.00*	*120.00*	*135.00*	*145.00*	*145.00*	......	......	.....	.....
Los Angeles ¹	*105.00*	*105.00*	*103.00*	*103.00*	*103.00*	*103.00*	*120.00*	*130.00*	*120.00*	......	......	13.38ab	16.26ab
Minneapolis #	*130.00*	*130.00*	*130.00*	*130.00*	*130.00*	*130.00*	*150.00*	*159.00*	*150.00*	......	......	16.56	20.16
Montreal ab	92.00	98.00	93.00	95.00	107.00	109.00	......	......	......	......	......	.....	.....
	175.00	*175.00*	*175.00*	*175.00*	*175.00*	*175.00*	*140.75*	......	......	......	......	.....	.....
New Orleans †	80.00	83.00	79.00	80.00	83.00	85.00	100.00	......	......	135.00	135.00	18.72	22.80
†	*76.00*	*78.00*	*80.00*	*80.00*	*80.00*	*77.50*	*77.00*	*76.00*	*70.00*	......	......	.....	.....
New York ²	109/112	112/115	105/115	115/120	120/125	125/130	150/160	......	......	210/240f	210/240f	22.86	27.90
	....	....	*Range from $120.00 to $125.00*				*135/150*	*145/150*	*145/150*	......	......	.....	.....
New York **	95.00	98.00	80.00	92.00	97.00	101.00	115.00	......	......	......	......	.....	.....
	105.00	*105.00*	*107.00*	*107.00*	*107.00*	*107.00*	*112.00*	*125.00*	*125.00*	......	......	.....	.....
Philadelphia			Range from $117.00 to $127.00				117/127	......	......	190/200	190/200	22.86	27.90
			Range from $130.00 to $140.00				*130/140*	*140/150*	*140/150*	......	......	.....	.....
Pittsburgh †			Range from $85.00 to $90.00			90/100	90/105	......	......	95/100	110/120	22.56	27.48
			Range from $95.00 to $105.00			*95/105*	*105/120*	*140/159*	*140/150*	......	......	.....	.....
St. Louis #c	124.50	126.50	110.75d	120.50	125.00e	135.00d	......	......	......	......	......	18.72	22.80
	....	....	*136.75i*	*136.25e*	*136.25e*	*135.00e*	*152.50e*	*164.50*	*164.50*	......	......	.....	.....
San Francisco A†	*75/80*	*75/80*	*75/80*	*75/79*	*75/79*	*74/78*	*75/78*	*77/82*	*77/82*	......	......	10.08a	12.30a
Seattle †	*82.50g*	*82.50g*	*82.50g*	*82.50g*	*82.50g*	*82.50g*	*82.50g*	*82.50g*	*82.50g*	......	......	.....	.....

† F.o.b. mill. * F.o.b. city, CL, out of yard. ** F.o.b. city, CL, direct mill shipment. ‡ Deliv. to contr. CL. 1. Retail, LCL, at yard. # Retail, LCL, deliv. 2. Deliv. truck lots. 3. asd.

LUMBER: **Bold Face type, Southern Pine.** *Italics, Douglas Fir.* *a* Spruce *b* Tax exempt. *c* 5M lots. *d* 8–12 ft. lengths. *e* 8–16 ft. lengths. *f* 18 ft. or under. *g* No. 1 common. *i* 8 ft. lengths. *k* No. 3 common

A Rail freight rate from Northwest mills to San Francisco are $11.50 to $15.00 per M ft bm. From Northern Calif. mills $9.00 by rail $12.00 by truck to yard with surfaced stock $2.00 to $3.00 less.

PLYWOOD: Special concrete form grade Fir Plywood, 4′ by 8′ panels, 5-ply, sanded 2 sides, water resistant glue, carload lots, delivered per 1,000 sq. ft. surface. Seattle base price on ⅝", $204.00; on ¾", $231.00. For other centers add rail freight increment from table on proper size. Oiling and edge sealing charges included. *a* Lower rate by water shipment. *b* 50,000 lb. minimum.
* Freight rate increase of 6¢ per cwt., not included in these figures.

GLASS, EXPLOSIVES, CHEMICALS

	WINDOW GLASS Discounts from jobbers list, Feb. 1, 1950*a* Single or Double Thickness A quality	 B quality	EXPLOSIVES Per lb. 40% Ammonia Gelatin in 50 lb. cases delivered in 200 lb. lots*
Atlanta	76%*e*	76%*e*	$0.2275
Baltimore	70–10%	78–10%	.2275
Birmingham	83%	83%	.1750
Boston	79–10%	79–10%	.2275
Chicago	78%*f*	78%*f*	.2275
Cincinnati	78%	78%	.2275
Cleveland	78–10–10%*f*	78–10–10–10%*f*	.2675
Dallas	75%	75%	.2350
Denver	81–5%	81–5%	.2325
Detroit	78–10–10%	78–10–10%	.2275
Kansas City	80–10–10%	80–10–10%	.2325
Los Angeles	75%	80%	.23
Minneapolis	78–10%	78–10%	.2325
Montreal	40–5%*bc*	40–10–5%*bc*	20.00*hi*
New Orleans	83%	83%	.2325
New York	82%*f*	82%*f*	.38*g*
Philadelphia	76%	78%	.2275
Pittsburgh	82%	82%	.20
St. Louis	70–10%*e*	70–10%*e*	.2325
San Francisco	70%	76%	.2275
Seattle	52%*e*	53%*e*	.23

Price of 60% Ammonia Gelatin is $0.0125 per lb. higher than 40%

Glass; a Jobbers' list price per box, 14 x 20, ss, $42.75 for A quality, $37.50 for B quality; 14 x 20, ds, $60.00 for A quality, $52.75 for B quality. *b* Discount from list, Sept. 1939; sales tax included, but 6% tax exemption not allowable for. *c* Single thickness. *e* Discount from list of Jan. 16, 1946. *f* Disc from Oct. 1950.

Explosives; * Urban prices influenced by service charges or local storage and delivery regulations do not consistently reflect quantity prices in less congested areas. *g* In borough of Kings, Queens, and Richmond and in Manhattan south of Canal St., add delivery charge of $9.00 per trip. *h* F.o.b. city per 100 lb. forcite, 40%. Forcite 60%, $21.75. *i* F.o.b. Beloeil (near Montreal).

40% Ammonia Gelatin price ranges in other than urban areas, per lb.
(except Seismograph Grades)

	C/L 20,000 lb. net	Tons	200 lb. lots
E. of the Miss., except Fla. and Me.	$0.175	$0.2075	$0.2275
W. of Miss. to Rocky Mtn. States, Fla. and Maine	.18 –.1875	.2125–.22	.2325–.24
Rocky Mtn. States	.18 –.1925	.2125–.22	.2325–.245
Pacific N. W. States	.1775–.19	.21 –.2225	.23 –.2425
Pacific S. W. States	.175 –.1825	.2075–.21	.2275–.2325

PILES, TIES F.O.B.

PILES

Prices per linear foot, fir and pine, bark off, f.o.b. cars, New York. Fir based on Wash. and Ore. points to New York shipping area; pine based on freight from Norfolk.

Dimensions	Points	Length	By Rail Pine*	 Fir
12-in. at butt	6-in.	30 to 50-ft.	$0.43	....
12-in.— 2-ft. from butt	6-in.	50 to 59-ft.	.46	....
12-in.— 2-ft. from butt	6-in.	60 to 69-ft.	.50	....
12-in.— 2-ft. from butt	6-in.	90 to 100-ft.	....	....
13-in.— 3-ft. from butt	5-in.	91 to 100-ft.	....	....
14-in.— 2-ft. from butt	6-in.	50 to 69-ft.	.50/.60	....
14-in.— 2-ft. from butt	6-in.	70 to 79-ft.	.65	.85
14-in.— 2-ft. from butt	5-in.	80 to 85-ft.	.75	.86
14-in.— 2-ft. from butt	5-in.	85 to 89-ft.	....	.92
14-in.— 2-ft. from butt	5-in.	90 to 100-ft.	....	.94

* Pine piling over 80-ft. available only in limited quantities.

RAILWAY TIES

Prices f.o.b. per tie for carload lots:		6"x8"x8′ Untr.	 Tr.	7"x9"x8′6" Untr.	 Tr.
Boston	Oak *i*	....	....	....	....
	Pine *i*	....	....	....	....
New York	S. L. Sap Pine	$1.65	$3.00	$2.25	$3.40
	Mixed Oak	2.00	3.20	2.50	3.70
Birmingham	Hardwood	2.00	3.13*a*	2.68	4.16*a*
Chicago	Red Oak	....	4.00	....	5.00
Los Angeles	Douglas Fir	....	....	....	....
	Redwood	....	....	....	....
Philadelphia	Red Oak	2.15/2.33	3.10/3.13*a*	3.00/3.10	4.15/4.25*a*
St. Louis	White Oak	2.87	....	3.55	....
	Red Oak	2.77	3.42*a*	3.53	4.40*a*
	Sap Pine or Cypress	3.25*a*	....	4.15	....
San Francisco	Douglas Fir	2.56*e*	3.84*ef*	3.36*bf*	5.04*caf*
Montreal	Birch or Maple	....*h*	....*h*	....*h*	....*h*

Tr.— Treated; Untr.— Untreated. *a* Creosoted. *b* 7" x 9" x 8′. *c* Empty cell. *e* Green. *f* F.o.b. cars. *h* No constant price available. *i* Not available.

CHEMICALS

Water, sewage treatment, road work, f.o.b. carlots, New York

Bleaching powder in drums f.o.b. works, per 100 lb	$6.00
Chlorine cylinders, liquid, per lb. f.o.b. works	.0875
Calcium chloride, 77–80%, flaked, 100-lb. paper bag, f.o.b. works, ton	25.00
Silicate of soda, 52 deg., in drums, f.o.b. works, per 100 lb	2.20
Soda ash, 58%, in paper bags, per 100 lb. dense	1.60
Sulphate of aluminum, commercial, in 100-lb. bags f.o.b. works	1.65
Sulphate of copper, in bags, 99% per 100 lb. f.o.b. works	8.95

STRUCTURAL CLAY BUILDING TILE, BRICK AND LIME—DELIVERED

	STRUCTURAL CLAY TILE PARTITION — SCORED Per M. lots of 2,000 pieces or over,			STRUCTURAL CLAY TILE — LOAD BEARING — SCORED Per M. lots of 2,000 pieces or over,			BRICK Per M. in quantity		LIME Per ton, In paper, Carload lot,		
	3x12x12 in.	4x12x12 in.	8x12x12 in.	8x12x12 in.	10x12x12 in.	12x12x12 in.	Common backing	Straight hard	Hydrated finishing	Common hydrated	Pulverized, or lump
Atlanta	......	......	......	......	......	......	$26.75	$26.75	$19.00	$17.50	$17.50
Baltimore	$180.00	$191.00	$358.00	$402.00	530.00	605.00	37.00*k*	42.00*k*	30.00	20.60	.....
Birmingham	118.00*p*	128.00*p*	236.00*p*	283.00*p*	......	......	23.50*ff*	28.00*gg*	26.37	17.10	.....
Boston	149.00†	161.50†	298.00†	338.00†	......	......	33.50*i*	36.50*i*	32.30†	27.90†	.....
Chicago	135.00	145.00	280.00	......	......	......	21.00	23.00	30.80	26.00	.....
Cincinnati	185.00*j*	195.00*j*	340.00*jdd*	......	......	......	43.00*j*	46.00*j*	26.00*j*	24.25*j*	.....
Cleveland	149.00**^A^	156.00**^A^	......	......	......	......	32.00	32.00	25.50	23.50	31.00*ee*
Dallas	......	110.00	......	......	......	......	18.75	.....	31.90	21.80	.....
Denver	......	......	......	......	......	......	34.00	40.00	34.80*bb*	28.00*bb*	34.00*bb*
Detroit	118.18	126.08	236.40	......	293.30	$335.20	33.50*cc*	32.50*cc*	32.00	32.00	.....
Kansas City	115.00	122.50	245.00	245.00	303.50	367.00	26.00*o*	26.00*o*	30.50	24.50	27.00
Los Angeles	*r*	*r*	*r*	*r*	*r*	*r*	20.00§	.....	34.00	34.00	35.00
Minneapolis	171.50*p*	192.50*p*	386.00*p*	192.50*wp*	......	......	32.00*vp*	36.00	37.00*bbe*	28.00*bbe*	38.00*bbde*
Montreal	143.00*aq*	157.00*au*	292.00*au*	......	......	......	26.50	36.50	24.60	.....	20.00*u*
New Orleans	160.00	160.00	300.00	......	......	......	29.00	.....	38.00	26.00	37.50
New York	121.60*h*	129.70*h*	178.30*ch*	194.60*hn*	......	......	38.50	.....	38.00	32.00	.....
Philadelphia	126.30	134.80	252.60	302.74	361.35	455.74	29.00	32.00	36.00	21.50	28.50
Pittsburgh	112.00	117.00	189.00	216.00	279.00	317.00	32.00	40.00*y*	25.00	23.00	2.97*m*
St. Louis	136.00*cc*	156.00*cc*	226.00*cc*	307.50*cc*	345.00*cc*	......	40.00*sl*	36.25*sl*	.85*saa*	.60/.65*saa*	1.10*aaspee*
San Francisco	156.85*a**	177.10*a**	235.30*dda**	187.20*ta**	......	......	35.00	.....	26.30	26.30	2.58*m*
Seattle	160.00*cc*	175.00*cc*	......	175.00*ccw*	......	......	39.00*s*	49.00*s*	37.50*shh*	1.50#	3.90*mhh*

† F.o.b. yard Roxbury. *a* Smooth. *b* Per 50 lb. bags. *c* 6 x 12 x 12 in.-3 cell. *d* Pulverized hot. *e* 5%, 10th following month. *g* 5½ x 8 x 12. *h* F.o.b. trucks, job site N.Y.C. *i* F.o.b. warehouse only. *j* Truck load or over. *k* $1.00 discount. *l* Red face. *m* Per bbl., 180 lb. *n* 7¼ x 7¾ x 12. Speed title. *o* F.o.b. Buffalo. *p* Truck lots. *q* Provincial and Municipal tax extra. *r* Not used because of earthquake danger. *s* 2% discount for cash. *t* 5½ x 8 x 11½. *u* Tax exempt. *v* Sand lime. *w* 5 x 8 x 12. *y* Stacked. *z* Pebble lime price per 80 lb. sack. *aa* Price per sack. Lime not sold per ton. *bb* LCL. *cc* Truck delivery. *dd* 6 x 12 x 12. *ee* Pebble lime. *ff* 80% common. *gg* Select. *hh* LCL. § F.o.b. plant. # Per 60 lb sack, no incr., ton price no longer quoted. **Only 1 plant producing, quotes on warehouse delivery, previous quotes were truck deliv. ^A^ Correction: March, 149.00 and 156.00 * F.o.b. Stockton.

PAINT, ROOFING—F.O.B. CARLOAD LOTS

	RED LEAD	WHITE LEAD	READY-MIXED PAINT Per gal., drums			ROOFING SUPPLIES Carload lots f.o.b. factory				
	Per 100 lb. in 600-lb. (Approx.) bbl. Dry *a*	Per 100 lb. in 100 lb. cases in oil *w*	Graphite *b*	Aluminum *c*	Ferric Oxide *d*	Rolls, slate surfaced, 85–90 lb. per sq.	Asphalt felt, per 100 lb.	Tar felt, per 100 lb.	Asphalt coating per gal.	Tar pitch 360 lb. bbl. per ton
Atlanta	$20.75	$31.025	$1.75	$2.70	$1.65	$2.06	$2.06‡	$2.06‡	$1.00‡	$36.00‡
Baltimore	20.50	30.65	2.65	4.10	3.22	2.50	4.17	4.17	.42	37.00
Birmingham	20.75	31.025	3.90	3.40	....	2.80	2.75	2.75	....	40.50*ee*
Boston	20.50	30.65	....	....	....	2.89*q*	2.79*o*	2.79*o*	.42	42.00
Chicago	20.50	30.65	...	....	....	2.73‡*u*	3.04‡*o*	3.04‡*o*	38.00‡*bbr*	43.00‡
Cincinnati	20.50	30.65	....	....	....	2.50	2.50*o*	2.50/2.75	.42*y*	42.36
Cleveland	20.50	30.65	2.75*pgg*	3.00*sgg*	2.65	2.50*q*	2.50*o*	2.50*o*	.36*y*	40.00
Dallas	20.75	31.40	....	4.05	....	3.50*q*	3.75*o*	4.35*o*	.36	46.00
Denver	21.00	31.15	2.96	4.50	2.86	3.25*o*	2.76*o*	2.76*o*	.47*ff*	42.00
Detroit	20.50	30.65	2.35	3.30	2.50	2.50	2.50*f*	2.50	.51	40.00
Kansas City	20.50	30.77	....	2.71	2.65	2.39	2.43*o*	2.43*o*	.313	48.00
Los Angeles	20.50	30.90	3.30	4.50	4.20	2.97	2.01*e*	*l*	.44	*l*
Minneapolis	20.50	28.55/30.77	....	....	....	2.50*idd*	2.50*hidd*	2.50*hidd*	.34*idd*	37.00*r*
Montreal	.....	20.70	3.75*t*	4.20*t*	4.62*t*	3.50*t*	3.25*tf*	3.25*tf*	1.10*t*	2.90*kt*
New York	20.50	30.65	3.45*y*	....	....	2.50	2.50*o*	2.50*o*	.34*z*	37.00
Philadelphia	20.50	30.65	3.25	3.65	3.15	2.54	2.94	2.94	.37	26.00
Pittsburgh	20.50	30.65	2.45	2.55	2.20	2.90	2.90*o*	2.90*o*	.39	42.00
St. Louis	20.50	30.65	....	....	....	2.50	2.50*h*	2.50*h*	.31*y*	38.00
San Francisco	20.50	30.90	2.40	3.40*n*	1.35	2.61	3.56*aa*	....	.41	.....
Seattle	20.50	31.15	2.51*m*	2.67*m*	....	3.58*mgcc*	3.05*hmcc*	....	.59*mcc*	52.00*jmcc*

‡ Delivered. Note: Red lead in oil 50c higher than white lead in oil. *a* Red lead prices change frequently due to pig lead price changes. *b* U. S. War Dept. Spec. 3–49A. *c* ASTM Spec. D266–31. *d* 80% minimum ferric oxide. *e* 15 lb. *f* Per 432 sq. ft. *h* Per roll. 65 lb. *i* Net carload lot prices; Minneapolis and vicinity. *j* Asphalt pitch. *k* Per cwt. *l* Not used. *m* 1% discount for cash. *n* May, 1941 price. *o* Per 30-lb. *p* 6-drum. *q* Per 90-lb. roll. *r* F.o.b. factory Chicago. *s* ASTM Spec. D266–41. *t* Federal tax included. *u* Per 90 lb. square. *v* Per ton. *w* Price to large paint contractors is $1.25 less. *x* Mineral surfaced. *y* 55-gallon container. *z* Drums *aa* Approximate cost per 100 lbs. *bb* Roofers coating and cement. Price per ton. *cc* LCL, truck delivery. *dd* 2% cash discount. *ee* Asphalt, in 100 lb. package. *ff* 5-gal. drums. *gg* F.o.b. factory.

SKILLED AND COMMON WAGE RATES—PER HOUR

	Brick-layers	Car-penters	Struct. Iron Workers	Hoisting Engineers	Plas-terers	Electrical Workers	Steam-fitters	Common Labor Building	Common Labor Heavy Const.
Atlanta	$2.50	$2.00	$2.25	$2.25	$2.50	$2.50	$2.35	$1.05	$1.05
Baltimore	3.00	2.35	2.65	2.60/2.80	2.50	2.50/2.75‡	2.50	1.35	1.35
Birmingham	2.75	2.125	2.35	1.975	2.30	2.50	2.50	1.10	1.20
Boston	2.775	2.375	2.70	2.60	2.85	2.60	2.60	1.75	1.75
Chicago	2.625*k*	2.55	2.60	2.50	2.81*n*	2.71*n*	2.60	1.90*m*	1.90*m*
Cincinnati	2.70	2.325	2.45	1.675/2.675	2.50	2.70	2.55	1.65	1.65
Cleveland	2.70*t*	2.825#	2.825	2.825	2.825	2.825	2.825	2.10	1.85
Dallas	3.125†	2.25	2.50	2.25	3.125†	2.50	2.375	1.20	1.35
Denver	3.00	2.35	2.25	2.35	3.00	2.50	2.40	1.50	1.50
Detroit	2.85	2.60	2.85*m*	2.80	2.964*l*	2.85	2.75*m*	1.90	1.90
Kansas City	2.675	2.225	2.375	2.225/2.45	2.825	2.425	2.625	1.65	1.65
Los Angeles	2.75	2.35	2.50	2.30	3.125	2.625	2.625	1.75	1.75
Minneapolis	2.40	2.12	2.275	2.07	2.50	2.56*n*	2.435	1.52	1.52
New Orleans	2.60	1.975	2.35	2.225	2.275	2.40	2.35	1.10	1.10
New York	3.548*r*	3.09*bo*	3.348*o*	3.348*c*	3.599*ar*	3.456*as*	3.286*p*	1.90	1.90
Philadelphia	3.31*i*	2.525	2.89*j*	2.65	3.075*k*	3.03/3.283*u*	2.825*k*	1.475	1.775
Pittsburgh	3.00	2.65	2.625	2.80	2.625	2.625	2.80	1.60	1.60
St. Louis	3.09*c*	2.50*h*	2.50	2.55	2.875	2.6775*c*	2.625	1.65	1.65/1.80
San Francisco	3.25*b*	2.375	2.575	2.19	3.00	2.75	2.625	1.65	1.65
Seattle	3.25	2.30	2.50	2.45	3.00	2.65	2.75	1.90	1.95
Montreal*	1.60	1.40	1.50	1.30	1.60	1.50	1.55	1.00	.85

a 6 hr. day. *b* 7 hr. day. *c* Incl. 3% vacation stamp fund for bricklayers; 2% for electricians. * Cost of living bonus now included in basic wage. # Includes 5¢ per hr. tool replacement. † Plus $5.00 daily bonus. *h* $2.20 homes and housing + 5¢ vacation fund. *i* Incl. 2% welfare. *j* Incl. 9¢/hr. welfare. *k* Incl. 7½ ¢/hr. welfare fund. *l* Incl. 4% vacation fund. *m* Incl. 5¢/hr. welfare ins. fund. *n* Incl. 6¢/hr. welfare fund. *o* Incl. 3% welfare fund. *p* Incl. 3% welfare fund and 3% pension fund. *r* Incl. 3% welfare fund and 20¢ pension fund. *s* Incl. 4% welfare and pension fund and 4% vacation fund. *u* Incl. 1% welfare fund. *t* Still negotiating as we go to press. ‡ 2.50 on old work, 2.75 on new contract.

MEXICO CITY PRICES

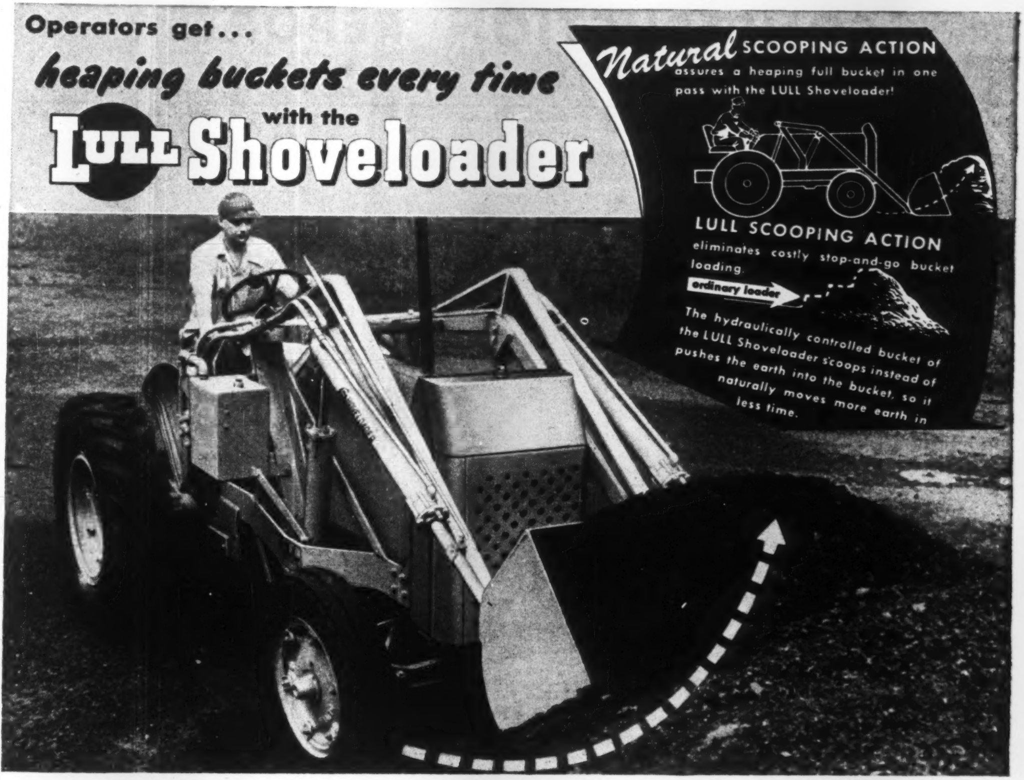
In Pesos, F.o.b. City		Feb. '51	Mar. '51
Common Wages—Building (8 hr. day)	av. per hr.	.72*	.72*
Common Wages—Heavy Const. (8 hr. day)	av. per hr.	.88*	.88*
Skilled Labor Wages			
Carpenters (8 hr. day)	av. per hr.	2.19*	2.19*
Bricklayers (8 hr. day)	av. per hr.	2.19*	2.19*
Struct. Iron Workers (8 hr. day)	av. per hr.	1.05*	1.05*
Struct. Steel Shapes			
3"–15" x 12 meters	per metric ton	1,073.30	1,073.30
Reinf. Steel, Corr. Rods			
⅜" x 11 meters	per ton	1,218.30	1,218.30
½" x 11 meters	per ton	1,208.30	1,208.30
⅝" x 11 meters	per ton	1,198.30	1,198.30
¾" x 11 meters	per ton	1,188.30	1,188.30
⅞" x 11 meters	per ton	1,188.30	1,188.30
1" x 11 meters	per ton	1,188.30	1,188.30
Gravel truck load of 3½ cu. meters			
Blue Gravel	per tr. load	36.00	36.00
Rose Gravel	per tr. load	34.00	34.00
Cement, Std. Port. (Tolteca)	per ton	125.00	125.00
Lumber			
Mex. Sacred Fir (Oyamel)	per M ft.	800.00	800.00
1st Class Pine	per M ft.	1050.00	1050.00
2nd Class Pine	per M ft.	950.00	950.00

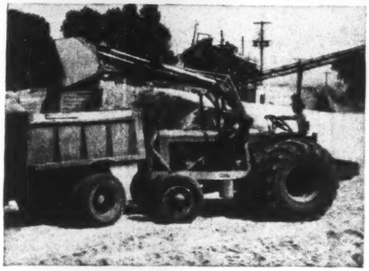
* Increase by 1/6th—work 6 days, paid for 7 days.

ENR Skilled Average: (Bricklayers, Carpenters, Ironworkers). $2.619 **ENR Common Average:** $1.595

Operators get...

heaping buckets every time with the LULL Shoveloader


Natural SCOOPING ACTION assures a heaping full bucket in one pass with the LULL Shoveloader!
LULL SCOOPING ACTION eliminates costly stop-and-go bucket loading.
ordinary loader
The hydraulically controlled bucket of the LULL Shoveloader scoops instead of pushes the earth into the bucket, so it naturally moves more earth in less time.



REACHES FRONT OF LARGE TRUCK BOX—Having the longest reach of any industrial wheel-type tractor loader, the LULL Shoveloader loads to the very front of the truck box from the rear. No special maneuvering is required. No blocking more than one traffic lane. Gives a full truck load every time without pushing dirt forward in box. Loads trucks faster too!

OPERATORS SAY they can really keep trucks moving with a LULL Shoveloader by getting a heaping full bucket every time. No stopping ... no backing up ... no lost time. When the forward run has started, pull back both control levers with one hand, and the Shoveloader will automatically tilt the bucket up ... then start digging. The scooping action of this double control is the most natural digging motion possible. Buckets are filled quickly with one smooth movement. Full buckets mean truck boxes are filled faster. Keep those trucks moving with a LULL Shoveloader!

MORE PROFITS? SURE! With heaping full buckets and faster loading, you move more earth in less time and at less cost. Make your next loader a LULL Shoveloader!

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4

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CONSTRUCTION REPORTS

Bids Asked—Low Bidders—Contracts Awarded

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 18, N. Y.

ELSIE EAVES, Manager *J. A. MAHONEY, Reports* *M. R. ROESSLER, Statistics*

NEW ENGLAND

BIDS ASKED—BUILDINGS

▲† **Mass., Brockton**—HOSPITAL, etc.—B.A. 4/10—Veterans' Admin. Technical Service, Munitions Bldg., Wash., D. C., hospital bldgs., utilities, Manly and West Chester Sts., No. 7-4050, $17,000,000. Extended date. CD 1/8.

LOW BIDDERS—BUILDINGS

Carlson Constr. Co., 555 Mt. Auburn St., Watertown, Mass. Low Bidder. **$615,959.** Central Elementary SCHOOL, Bartlet St.; **Joseph Rugo, Inc.**, 581 Boylston St., Boston, Mass., **$348,922.** West Andover Elementary SCHOOL, Beacon St., ANDOVER, MASS. Town, Supt. Schools, Andover, Mass. Bids Mar. 15. CD 2/28.

CONTRACTS—BUILDINGS

C. H. Nickerson & Co., Burilville St., Torrington, Conn., Contract Awarded, **$157,850.** refuse truck garage, WATERBURY, CONN. City, P. Wks. Dpt., City Hall, Waterbury, Conn.

MIDDLE ATLANTIC

BIDS ASKED—BUILDINGS

N. Y., New York—NURSES SCHOOL, etc.—B.A. 4/11—Dpt. P. Wks., Municipal Bldg., Zone 7, Contr. 1, demolition, general constr. work; elevators and dumbwaiters, metal equip. top soiling and planting; Contr. 2, plumbing and kitchen equip.; Contr. 3, heating, ventilating, air-conditioning, refrigerator work; Contr. 4, electrical and lighting fixtures for Nurses School and residence at Bellevue Hospital. Plans deposit $50 for Contr. 1; $25 each Contrs. 2, 3, and 4. Extended date. CD 3/12.

Pa., Allentown — HOSPITAL — B.A. 4/27 — Allentown Hospital, 17 and Chew Sts., general constr.; heating; plumbing; electrical work for administration bldg. Plans deposit $30 for general constr., $20 each for heating, plumbing, electrical work. Robert Lange & James M. Everett, 12 N. 6 St., archts.; adv. ENR 4/5. CD 9/20/44.

LOW BIDDERS—HEAVY CONSTRUCTION

John DeMichiel & Bros., Inc., 58 High St., Torrington, Conn. Low Bidder, **$193,493,** est. $224,000. 2.85 mi. Manorton-Lake Taghkanic, Pt. 2, County Road 49, FA.SS. 51-5, Columbia Co.*****Law Bros. Co. & A. J. Leaf**, 200 N. Main St., Herkimer, N. Y., **$558,247,** est. $585,000, 10.68 mi. Indian River-Remington Corners County Road, FA.SS. 51-4, Lewis Co.*****Howes & Farrell, Inc.**, Wampsville, Oneida, N. Y., **$362,692,** est. $388,000, 0.99 mi. Virgil-Messengerville, Pt. 3, FA.SS. 51-1, Cortland Co.*****Bero Eng. & Constr. Corp.**, McKinley Bldg., Buffalo, N. Y., **$633,987,** est. $776,000, 5.56 mi. Parkway, 1.12 mi. access road, Lake Ontario State Parkway, Sect. B, LOSP. 51-1P, LOSP, 51-2, Monroe Co.*** received no bids Mar. 21, 0.26 mi. Pine Island New Jersey State Line County Road 26, FA.SS. 51-7, Orange Co.; 0.57 mi. Bainbridge-Masonville, Pt. 1 and Pt. 1A, FAS.SH. 51-1, FAS.SH. 51-2P, Chenango Co., NEW YORK. Bureau Contracts & Accounts, The Governor Alfred E. Smith State Office Bldg., Albany, N. Y. Bids Mar. 21. CD 3/9.

City, City Hall, 65 Central Ave., Hackensack, N. J., rejected bids Mar. 1, refuse disposal plant alterations, addns., River St., HACKENSACK, N. J. Project abandoned. CD 2/23.

LOW BIDDERS—BUILDINGS

Blake Constr. Co., 33 E. St. S. W. Wash., D. C. Low Bidder. **$456,248,** Delaide Davis SCHOOL addn., 44 Pl. and H St. S. E., WASH., D. C. Distr. Comrs., District Bldg., Wash., D. C. Bids Mar. 22. CD 3/14.

CONTRACTS—BUILDINGS

Messick Bros., 531 E. Commerce St., Bridgeton, N. J., Contract Awarded, **$364,894,** SCHOOL, MARGATE, N. J. Margate Bd. Educ., Margate, N. J. Bids Feb. 21. CD 2/1.

▲ **Howard Kiehl**, 301 W. State St., Trenton, N. J., Separate Contracts, **$1,300,000.** APARTMENT DEVELOPMENT, Hamilton Twp., TRENTON, N. J. Paul Trapani, 60 Burke Ave., Bronx, New York, N. Y. archt.

▲ **Kaywin Home Builders, Inc.**, Schoenersville Rd., Bethlehem, Pa. Separate Contracts. **$3,437,500.** RESIDENTIAL DEVELOPMENT, BETHLEHEM, PA.

Phila. Electric Co., 900 Sansom St., Phila., Pa., Separate Contracts. **$500,000.** Palmer St. SUB-STATION, PHILA., PA. United Engineers & Constructors, Inc., 1401 Arch St., Phila., Pa., engr.

R. S. Noonan, Inc., 26 N. Duke St., York, Pa., Contract Awarded. **$100,000.** 1 story, 150x150 ft., brick, block WAREHOUSE and OFFICE, WEST READING, PA. Sherrill Noonan Co., Inc., 26 N. Duke St., York, Pa.

SOUTH

BIDS ASKED—BUILDINGS

▲ **Tenn., Chattanooga**—SCHOOL—B.A. About 5/1—City, South Market Street Negro School. $2,000,000. Hunt, Caton & Assoc., James Bldg., archts. CD 11/6/50.

SOON LETS CONTRACT—BUILDINGS

Va., Alexandria—STORES and OFFICE—Virginia Alcoholic Beverage Control Bd., William B. Wilkinson, secy., Fourth and Grace Sts., Richmond, soon lets contract 2 story, 32x125 ft. office and store bldg., 428-30 King St. Plans deposit $25. Robert H. Willgoos, 123 N. Fairfax St., archt.

BIDS ASKED—HEAVY CONSTRUCTION

Guy H. Lewis & Son, McLean, Low Bidder, **$218,206,** grade separation structure and 0.58 mi. approach road at intersection of U. S. 1 and the Shirley Hy. at Woodbridge, Route 350, Fairfax Co.*****Echols Bros., Inc.**, Staunton, Va. **$134,163,** 315 ft. bridge and over South River at Grottoes, replacing a weak wooden-floored structure, Route 256, Rockingham and Augusta Counties*****Ralph E. Mills Co., Inc.**, 1210 Tennessee St., Salem, Va. **$70,440,** overpass of the N. & W. Railway near intersection of Route 24, Secondary Route 1004, Town of Vinton, Roanoke Co., VIAGINIA. State Hy. Dpt., Richmond, Va. Bids March 20, CD 3/7.

† **Diamond Constr. Co.**, 14 and M Sts. S.E., Wash., D. C., Low Bidder, **$773,574,** constr. waterfront facilities at U. S. Naval Amphibious Base, Little Creek, NOY 24497, Spec. No. 27737, NORFOLK, VA. P. Wks. Office, Fifth Naval Dist., U. S. Naval Base, Norfolk, 11, Va. Bids Mar. 20, CD 3/1.

Pendleton Constr. Corp., Wytheville, Va. Low Bidder, **$359,628,** 2.46 mi. 24-ft. macad. to extend the four-lane divided construction of U. S. 11 west from Radford Bridge, Pulaski Co.*****R. H. Rose**, 47 Towana Rd., Richmond, Va. **$96,258,** straightening, paving 3.95 mi. west of Route US 460, Route 154, Prince George Co.*****Robert T. Main, Co.**, 1201 Florida St., Salem, Va. **$205,158,** straightening, rebuilding 4 mi. between Westham (Huguenot) Bridge and Robious Station, Route 147, Chester Co.*** **Ames & Webb, Inc.**, 3145 Broad Creek Rd., Norfolk, **$352,573,** construct U. S. 58-A and Route 337-A from Bank St. on City Hall Ave., Holt St., Liberty St. and State St. to Elk Pl. to form approaches for city's tunnel-bridge project, city of Norfolk, VIRGINIA. State Hy. Dpt., Richmond, Va. Bids Mar. 20. CD 3/7.

M. J. Bles, McLean, Va. Low Bidder, **$140,770.** water distr. sys., 20,000 lin. ft. c. i. or transite pipe, fire hydrants, valves and fittings, Occoquan and Woodbridge Dist., MANASSAS, VA. Occoquan & Woodbridge Sanitary Dist., Manassas, Va. Bids Mar. 8. CD 2/21.

PROJECTS COVERED

Projects—By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $34,000; other public works $60,000; industrial buildings $82,000; other buildings $300,000.

Classes of Construction

(Name in order of Listing)

Water Supply
Sewers, Waste Disposal
Bridges
Streets & Roads
Earthwork, Waterways
Latin America
Public Buildings
Commercial Buildings
Industrial Buildings
Unclassified

Stages Reported

PROPOSED WORK: Including appointment of engineers or architects.

BIDS ASKED (new announcements only). For full calendar, see also preceding issues of ENR.

LOW BIDDERS: On jobs below $500,000 value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.

CONTRACTS AWARDED: Except awards to low bidders previously reported in low bidder stage.

Dates shown are of issue in which last previous report was published.

Symbols and Abbreviations Include:

†	Federal Government
▲	Project of $1,000,000 or over.
B.A.	Bids Asked
ENR	Engineering News-Record
CD	Engineering News-Record Construction Daily

LOW BIDDERS—BUILDINGS

▲ **English Constr. Co.**, Altavista, Va. Low Bidder, **$1,022,000.** RECEIVING bldg. at Southwestern State Hospital, MARION, VA. State, Richmond, Va. Bids Mar. 13. CD 2/1.

CONTRACTS—HEAVY CONSTRUCTION

Jack Hatcher, Staunton, Va. Owner builds. **$155,000.** motor court, STAUNTON, VA.

John Blom, Williamsburg, Va. Owner Builds. Approx. **$135,000.** motor court, WILLIAMSBURG, VA.

MIDDLE WEST

BIDS ASKED—HEAVY CONSTRUCTION

O., Vandalia—STORAGE FACILITIES—B.A. 4/18—U. S. Property & Disbursing Officer for Ohio, Bldg. 101, Fort Hayes, Columbus, Zone 18, gasoline storage facilities for 100,000 gal. aviation gas with underground tanks, piping, pumping facilities, pump house, paving, etc.

† **Ill., Rosiclare**—B.A. 4/25—U. S. Eng., 830 West Broadway, Louisville, 3, Ky., pump plant, Serial No. CIVENG 15-029-51-110.

Ill., Joppa—RAIL FACILITY, etc.—Bids Asked—Chicago & Eastern Illinois R.R., I. A. Moore, ch. engr., Danville, rail to barge facility at Joppa on Ohio River. $250,000.

BIDS ASKED—BUILDINGS

Ohio—ARMORIES—B.A. 4/11—Adjutant General's Dept., Bldg. 101, Fort Hayes, Columbus, Zone 18, Ohio National Guard armories 3 units at Middletown; 1 unit at Portsmouth; 1 unit at Lebanon and 1 unit at Pinesville. Total est. $600,000. CD 3/31, under O., Lebanon, and CD 1/9 under O., Middletown.

Ill., Gibson City—HOSPITAL—B.A. 4/17—Gibson City Hospital Assn., Gibson City, constr., furnishing new 50-bed Gibson City Hospital. $800,000. CD 7/11/50.

O., Dayton—SCHOOL—B.A. 4/17—Bd. Educ., Northbridge Local School Dist., E. F. Coy, clk., 5120 N. Dixie Dr., 1 story school. Plans deposit $10. Walker, Norwick & Assoc., 1301-4 American Bldg., Zone 12, archts. CD 11/28/45.

Ill., Chicago—FACTORY—Bids Asked—Symons Clamp & Mfg. Co., 4249 Diversey St., 1 story, brick, steel, concrete factory addn., loading dock. Fox & Fox, 30 N. LaSalle St., archts.

LOW BIDDERS—BUILDINGS

▲ **Coath & Goss**, 5103 W. Lake St., Chicago, 44, Ill. Low Bidder. **$1,226,580.** GRADE SCHOOL, Lamon Ave., 46 and 47 Sts., CHICAGO, ILL. Bd. Educ., 228 N. LaSalle St., Chicago, 1, Ill. CD 2/20.

CONTRACTS—HEAVY CONSTRUCTION

Cooke Contg. Co., 1116 Penobscot Bldg., Detroit, Mich. Contract Awarded. **$61,769.** Group 51-2, c. conc. 2,581 ft. Asbury Park St., DETROIT, MICH. City, Carl D. Warner, comr. Pub. Wks. Dpt., Detroit, Mich. Bids Feb. 27.

CONTRACTS—BUILDINGS

Robert W. Setterlin & Sons Co., 1030 W. 3 Ave., Columbus, O. Contract Awarded. consolidated motor freight TERMINAL, E. 5 Ave., near St. Clair St., incl. 50x395 ft. terminal bldg. with aprons on either side; maintenance garage with approx 5,000 sq. ft. space; 15,000 sq. ft. warehouse, Columbus, O. Scioto Warehouse Co., c/o Charles V. Schlairet, pres., Mt. Vernon, O. Al. F. Tynan, 387 E. Broad St., Columbus, O., archt.

▲† **Ohio Engineering Co.**, Lorain, O. Contract Awarded. rehabilitate platforms at 5 warehouses involving 83,000 sq. ft. pavement; **T. F. Scholes, Inc.**, 1214 Cherry St., Toledo, O. rehablitate 8 mi. track in the depot classification*****Steward Constr. Co.**, Marion, O., construct special WAREHOUSE*****Century Sprinkler Co., and Harry C. Siesbold**, 1401 Roseneath Rr., Richmond, Va., install sprinkler system in 5 warehouses, at Marion Engineer Depot. Est. $2,020,500. MARION, O. U. S. Eng., Madison Ave. and 8th St. West, Huntington, W. Va.

Schinnerer & Truemper, Inc., 3630 Bowser St., Fort Wayne, Ind. Contract Awarded. **$328,650.** Abbett SCHOOL addn., FORT WAYNE, IND. Bd. School Trustees, Fort Wayne, Ind. Bids Mar. 13.

Civilian Building & Supply Inc., 1405 N. Clinton St., Fort Wayne, Ind. Contract Awarded. **$137,000.** 16,000 sq. ft. FACTORY addn., 1302 E. Credighton Ave., FORT WAYNE, IND. Bowser, Inc., 1302 E. Creighton St., Fort Wayne, Ind. CD 5/8/45.

WEST OF MISSISSIPPI

BID ASKED—HEAVY CONSTRUCTION

Mo., St. Louis—B.A. 4/17—City, Frank J. McDevitt, pres. Bd. Pub. Serv., rein.-con. bridge on Weber Rd. over Gravois Creek, $61,000. W. R. Crecelius, 301 City Hall, Zone 3, ch. engr. CD 2/5/45.

† **Kan., Kansas**—B.A. On Or About 4/24—U. S. Eng., 601 Davidson Bldg., Kansas City 8, Mo., constr. Jersey Creek Sewer, CIVENG 23-028-51-110.

† **Montana**—RADIAL-GATE HOISTS—B.A. 4/24—Bureau Reclamation, Dpt. Interior, Bldg. 1A, Denver, Colo., furnishing 4 motor-operated radial-gate hoists for Canyon Ferry Dam, Missouri River Proj. DS 3365; adv. ENR 4/5.

BIDS ASKED—BUILDINGS

Tex., Dalhart—SCHOOL—B.A. 4/16—Dalhart Independent School Dist., Dalhart, 2 story, brick, hollow tile, concrete, steel high school, concrete slab fdn. $600,000. Plans deposit $25. Extended date. Rittenberry & Rittenberry, 1000 Fisk, archts. CD 3/16.

Tex., Fort Worth—PLANT—Bids Asked—Lucerne Milk Co., 819 Penn St., fluid milk plant. $500,000. W. G. Clarkson, 1st. Natl. Bank Bldg., archt. CD 2/8.

SOON LETS CONTRACT—BUILDINGS

Mo., Sugar Creek — RESEARCH and ENGINEERING — Standard Oil Co. of Indiana, 910 S. Michigan St., Chicago, Ill., soon lets contract 3 story, rein.-con., brick research and engineering bldg. Holabird, Root & Burgee, 180 N. Wabash St., Chicago, Ill., archts.

LOW BIDDERS—HEAVY CONSTRUCTION

Welden Bros., Iowa Falls, Ia. Low Bidders. **$85,984.** bridges, culverts S-995 (1), Mitchell Co., IOWA State Hy. Comn., Ames, Ia. Bids Mar. 20. CD 3/8.

▲ **Cameron, Joyce & Co.**, Keokuk, Ia., Low Bidder, **$123,509,** pavement wid'n. resurf. 0.966 mi. U-845 (2), Lee Co.; **$452,038,** pavement wid'n., resurf. 7.594 mi. Div. 1, FN-845 Lee Co.; **$407,325,** rolled stone base and bit. 14.339 mi. FN-338, Louisa and Muscatine Counties*****R. B. Burch, Inc.**, 509½ 3 Ave. S.E., Cedar Rapids, Ia., **$84,404,** pavement wid'n., resurf. 7.594 mi. Div. 2, FN-845 Lee Co.; **$120,807,** grading 9.009 mi. FN-872 Clinton Co.*****Hargrave Constr. Co.**, 2424 Bever St. S.E., Cedar Rapids, Ia., **$109,804,** b.conc. and bit. 4.289 mi. S-36 (3) Black Hawk Co.; **$98,851,** b.conc. and bit. 4.304 mi. S-614 (4), Black Hawk Co.*****Concrete Materials & Constr. Co.**, 405 Granby Bldg., Cedar Rapids, Ia., **$269,262,** rolled stone base and bit. 16.858 mi. FN-572, Des Moines Co.; **$105,876,** 2.732 mi. FN-744, Louisa Co.*****Fred Carlson Co., Decorah, Ia., $65,221,** paving 0.904 mi. FM-264B, Dubuque Co.*****Iowa Road Bldg. Co.**, Fairmont, Minn. **$87,237,** b.conc. and bit. 8.409 mi. SN-312D, Kossuth Co.*****Kaser Constr. Co.**, West Des Moines, Ia. **$152,840,** bit. 4.616 mi. FN-781 Appanoose Co.*****S. J. Groves & Sons Co.**, 510 Wesley Temple Bldg., Minneapolis, Minn., **$285,399,** rolled stone base and bit. 9.1671 mi. FN-975, Bremer Co.*** **Roverud Constr. Co.**, Spring Grove, Minn., **$113,900** 4.826 mi. SN-1354, Dubuque Co.*****Gus Ostermann & Sons**, Ocheyedan, Ia., **$121,083,** grading 10.019 mi. F-85 (15), Butler Co.*****Orville Eblen Constr. Co.**, Atlantic, Ia., **$116,912,** grading 7.816 mi. FN-341, Cass Co.*****Lowe Constr. Co.**, Marion, Ia., **$118,464,** grading 6.674 mi. FN-249, Delaware Co. *****Ronald Kenyon Co.**, 329 59 St., Des Moines, Ia., **$62,814,** grading 6.858 mi. FN-572, Des Moines Co., IOWA. State Hy Comn., Ames, Ia. Bids Mar. 20. CD 3/8.

† **C. A. Wagner Constr. Co.** 230 F 8 St., Sioux Falls, S. D. Low Bidder. **$652,268,** railroad relocation, Stage 3 near Chamberlain, Inv. 89, SOUTH DAKOTA. U. S. Eng., 1709 Jackson St., Omaha, Neb. Bids Mar. 20. CD 2/23.

Austin Bridge Co., 1000 Singleton St., Dallas, Tex. Low Bidder, **$242,622,** est. $1,250,000. 8 span 540 ft. deck plate girder bridge, across Denton Creek, 13 mi. south of DENTON, TEX. Texas & Pacific Ry. Co., R. J. Gammie, ch. engr., Texas and Pacific Bldg., Dallas, 2, Tex. Bids Mar. 15. CD 2/27.

† **Consolidated Western Steel Corp.** 649 M & M Bldg., Houston, Tex. Low Bidder, **$125,217,** Items 1, 2 of Penstock 4 for Falcon Dam and power plant on Rio Grande River, Inv. No. D-4312-A, near ROMA, TEX. International Boundary & Water Comm., U. S. A. and Mexico, U. S. Sect. Box 1859, El Paso, Tex. Bids Mar. 9.

CONTRACTS—HEAVY CONSTRUCTION

W. W. Magee Co., 1397 Laurel Ave., St. Paul Minn. Contract Awarded. **21.88c** per cu. yd. dredging 1,600,000 cu. yd. in Lake Winona, WINONA, Minn. City, R. G. Wildgrube, city recdrs, Winona, Minn. Bids Mar. 5, CD 2/15.

Segrist & Stinson, Pasadena, Tex. Contract Awarded. **$146,000.** est. $200,000. South Park sanitary sewerage sys., 42 in. pipe mono., HOUSTON, TEX. City City Hall, 900 Brazos St., Houston, Tex. W. E. White, c/o owner, city engr. Bids Dec. 30.

Dallas County Fresh Water Dist. 15, c/o Jack Hefner, Willingham Dr., Dallas, Tex. Own Forces. **$63,000.** water lines, RICHARDSON, TEX.

Dallas County Fresh Water Dist. 15, c/o Jack Hefner, Willingham Dr., Dallas, Tex. Own Forces. **$63,000.** sanitary sewers, RICHARDSON, TEX.

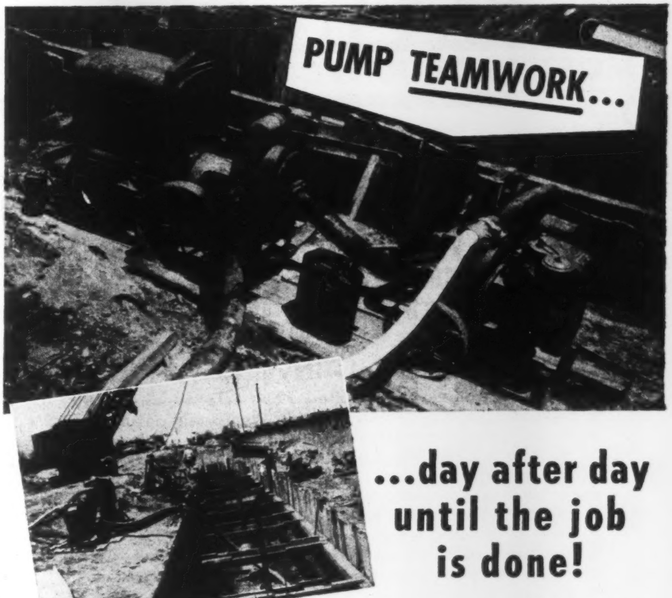
FAR WEST

BIDS ASKED—HEAVY CONSTRUCTION

† **Wash., Seattle**—APRON, etc.—B.A. 4/12—P. Wks. Officer, 13th Naval Dist., 1611 W. Wheeler St., repair concrete warm-up apron and floor of Hangar 193 at Naval Air Station, Specs. 26199. Plans deposit $10.

CONTRACTS—HEAVY CONSTRUCTION

† **Rockwell-Monroe Constr. Co.**, Sandpoint, Idaho. Contract Awarded, **$171,652,** constr. 33.9 mi. Columbusa-Ellensburg 115 kv line, INV. 5642, Douglas, Chelan and Kittitas Counties, WASHINGTON. Bonne-



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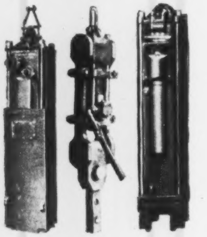

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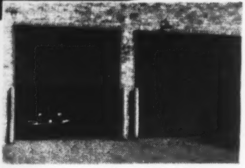

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KINNEAR ROLLING DOORS

ville Power Admin., 827 N. E. Oregon St., Portland, Ore. Bids Mar. 20. CD 3/6.

Puget Sound Power & Light Co., Stuart Bldg., Seattle, 1, Wash. Day Labor. **$89,000,** transmission line from Anacortes to Dean's Corner, and sub-station at Dean's Corner, WASHINGTON.

† **Cosmo Gilo**, Mehama, Ore. Contract Awarded. **$179,644**, construct 1.15 mi. Kinney Creek timber access road and 1.79 mi. French Creek timber access road, CIVENG 35-026-51-190, Marion Co., OREGON. U. S. Eng., Pittock Block, Portland, Ore. Bids Mar. 8. CD 2/15.

Vernie Jarl, 528 S. Roberts St., Gresham, Ore. Contract Awarded. **$928,820.** grading, paving 3.7 mi., detour road 1.89 mi. Columbia River Hy., Hood River Co., OREGON. State Hy. Comn., State Office Bldg., Salem, Ore. Bids Jan. 24, awarded Mar. 16. CD 1/30, under LB.

CONTRACTS—BUILDINGS

Stein Bros., Eugene, Ore. Contract Awarded. **$200,000.** 3 story, rein.-con. WAREHOUSE, EUGENE, ORE. Eugene Fruit Growers Assn., Eugene, Ore. John Swofford, Eugene, Ore., engr.

CANADA

BIDS ASKED—BUILDINGS

▲ **Que., Montreal**—LIBRARY—B.A. 4/16—Bd. Governors McGill University, Dr. F. C. James, principal, 4 story, 147x225 ft., rein.-con., limestone Redpath Library addn. Approx. $1,500,000. McDougall, Smith & Fleming, 2135 McGill College Ave., Montreal, Que., archts. McDougall & Friedman, 1235 McGill College Ave., Montreal, Que., engrs. CD 6/14/43.

PROPOSED PROJECTS

WATER SUPPLY

▲ **Calif., San Diego**—City Civic Center Bllg., **$2,000,000** bond election Apr. 17, replacing deteriorated water lines, rebuilding 2 basins, cement lining of pipes and pumping plant. G. E. Arnold, city water dir. CD 1/4.

▲ **Ga., Augusta**—City, addnl. water facilities to serve new areas, **$6,000,000.** Robert & Co. Assocs., 96 Poplar St. N. W., Atlanta, Ga., consult. engrs.

▲ **Ill., McCook**—Village, Village Hall, water line from Chicago at Kostner and 30 Sts., via Berwyn (city) and cities of Cicero and Lyons, **$1,250,000.** Edwin Hancock Eng. Co., 1509 W. Jackson St., Chicago, Zone 7, consult. engr. CD 4/11/46.

▲ **Mass., Tewksbury**—Town, John Cooney, chn. Water Comm., Town Hall, laying water pipes and supply source, **$1,600,000.**

▲ **S. C., Aiken**—City, WW imprvs., addns. to handle population expected by construction of H-bomb plant nearby.. **$1,890,000.**

▲ **Wash., Ephrata**—City, City Hall, imprv. water sys. by storage and wells, **$400,000**; pumping units and 24 in. pipe line from Rocky Ford Springs, **$676,245;** 14 mi. industrial pipe line from Long Lake Reservoir, **$2,000,000.** Parker, Hill & Ingman, Smith Tower, Seattle 4, Wash., consult. engrs. CD 3/13.

▲ **Ont., Cooksville**—Toronto Twp., Cooksville, Ont., filtration plant and pumping station to supply 2½ m. g. water daily, two 2 m. g. reservoirs. **$1,350,000.**

SEWERS, WASTE DISPOSAL

▲ **Calif., Alameda**—City, City Hall, voted **$1,250,000** bonds, sanitary sewers to connect with East Bay Municipal Dist. interceptor line. B. H. Maynard, city engr. CD 1/35.

▲ **Calif., Bakersfield**—Bd. Supervs. Kern Co., Court House, sanitary sewerage sys. for Union Ave. Sanitary Dist. **$1,065,000.** R. E. White, 1716 Oak St., Bakersfield, consult. engr.

Calif., Richmond—City, City Hall, sewage disposal plant, **$160,000.** Clyde C. Kennedy, 604 Mission St., San Francisco, Calif., consult. engr. CD 10/31/45.

Calif., San Diego—City Council, Civic Center voted **$750,000** bonds, 6 sewer development projects. A. K. Fogg, c/o owner, engr. CD 2/21.

▲ **Ga., Augusta**—City, addnl. sewer facilities to serve new areas, **$10,000,000.** Patchen & Zimmerman, Daniel Field, Augusta, consult. engr.

▲ **Mass., Springfield**—City, P. Wks. Dpt., City Hall, incinerator. **$1,114,000.** Hayden & Buchanan, 810 Park Square, Boston, consult. engrs.

▲ **N. J., Lambertville**—Lambertville Sewer Auth., Lambertville, complete borough sanitary sewerage syts. incl. sewer lines and sewage disposal plant, **$1,200,000.** Frank Bohren, 90 Main St., Flemington, consult. engr. CD 10/17/45.

▲ **N. Y., Rye**—Town, lateral sewers in area adjoining Village of Portchester. **$1,200,000.** CD 11/9/44.

Pa., Ridgeway—Ridgeway Boro, Ridgeway, sewage treatment plant, etc. **$500,000.** C. K. Gifford, Masonic Bldg., Ridgeway, c/o owner, engr. CD 12/19/45.

▲ **S. C., Aiken**—City, expand sewerage sys. to handle population expected by construction of H-bomb plant nearby. **$2,997,000.**

▲ **Alta., Calgary**—City, D. H. Mackay, mayor, City Hall, exten. sewage disposal plant, storm sewers, and new disposal plant at Ogden. **$3,000,000.** J. Ivor Strong, City Hall, city engr. CD 10/7/43.

BRIDGES

▲ **New Jersey and Pennsylvania**—Delaware River Joint Comn., Bridge Plaza, Camden, 6 lane highway toll bridge between Oregon Ave. and 10 St., Phila., Pa., and Fairview Ave. and Black Horse Pike, Camden, N. J., 11,251 ft. long span, **$69,418,000.**

▲ **Pennsylvania**—State Hy. Dpt., Harrisburg,

Luzerne Co.—construct bridge over Susquehanna River at Nanticoke. **$2,000,000.** E. L. Schmidt, c/o owner, ch. engr.

STREETS AND ROADS

▲ **Tex., Houston**—Harris Co., Court House, voted bonds, concrete road paving, **$5,000,000.** Hugo Zapp, co. engr. CD 2/14.

▲ **Alta., Calgary**—City, D. H. Mackay, mayor, City Hall, Calgary, roads, wid'n. streets, paving, **$2,300,000.** J. Ivor Strong, City Hall, city engr.

Ont., Brampton—Peel Co., Court House, paving 11 mi. roads in Malton Area. **$770,000.** N. L. Powell, Court House, engr.

▲ **Ont., Hamilton**—City, L. D. Jackson, mayor, City Hall, road tunnel from city to mountain to be known as Mountain Access Project, **$1,875,000.** Proctor, Redfern, & Laughlin, 11 Jordan St., Toronto, consult. engrs. W. L. McFaul, City Hall, city engr. CD 11/10.

EARTHWORK, WATERWAYS

Ohio—State Dpt. Natural Resources, A. W. Marion, dir., Columbus, imprvt. program at Portage Lakes area, **$100,000** for dredging for next 2 years **$125,000** for bridge on Turkeyfoot Lake near Swartz Rd. **$200,000** for Shoreline protection **$204,000** for channel connecting Miller and Turkeyfoot Lakes, parking, land, custodians residence, signs, surveys, etc. Total **$937,500.** CD 11/3/44, under O., Columbus.

▲ **Wisconsin** — Wisconsin Public Service Co., 1029 N. Marshall St., Milwaukee, 5000 kw. hydro-electric plant at Menard Isle in Wisconsin River, Tomahawk, Lincoln Co. **$2,100,000.**

AIRPORTS

▲† **Ill., Scott Air Force Base**—AIR FORCE BASE EXPANSION, etc.—Dpt. Air Force, Scott Air Force Base, Col. George W. Pardy, base commander, expansion imprvs. to air force base, incl. rehabilitation present bldgs., erecting new bldgs. for technical schools, barracks, mess halls, bachelor officers quarters, exten. facilities, runway, taxi strips, etc. **$10,157,000.**

▲† **Mont., Great Falls**—BARRACKS—U. S. Eng., 4735 E. Marginal Way, Seattle 4, Wash., plans by Naramore, Bain, Brady & Johanson, 904 7 Ave., Seattle 4, Wash., barracks at Air Force Base. **$1,200,000.** CD 2/9.

▲† **Neb., Fort Crook**—BARRACKS, etc.—U. S. Eng., 1709 Jackson St., Omaha, barracks, **$1,025,000;** central heating plant, **$100,000;** 4 three story barracks bldgs., **$900,000;** modification aircraft refueling sys., **$150,000,** all foregoing at Offutt Air Force Base.

▲† **Pa., Middletown**—TEST CELLS—Middletown Air Depot, U. S. Air Force, construct 4 jet engine test cells; hazardous test bldg. and 200,000 sq. ft. addnl. hangar space. **$1,500,000.**

▲† **S. D., Rapid City**—AIR BASE—U. S. Eng., 1709 Jackson St., Omaha, Neb., expansion Rapid City Air Force Base, near Weaver. **$8,548,000.** CD 10/26/48.

† **Tex., Lackland Air Base (San Antonio P. O.)**—PLANT—U. S. Eng., 606 Santa Fe Bldg., Galveston, cold storage refrigerator plant expansions. **$500,000.** CD 1/5.

▲† **Tex., Lackland Air Base (Br. San Antonio)**—BARRACKS—U. S. Eng., 606 Santa Fe Bldg., Galveston, plans by DeHaven Pitts, Travis Bldg., San Antonio, 3 airmen's barracks, **$660,000;** mess hall, **$350,000.** Wm. Orrison Engineers, Travis Bldg., San Antonio, consult. engrs. CD 3/20, under LB.

† **Tex., Lackland Air Base (Br. San Antonio)**—COLD STORAGE—U. S. Eng., 606 Santa Fe Bldg., Galveston, plans by Shoop & Roberts, 122 Olmos Dr. West, San Antonio, cold storage or refrigeration. **$500,000.** CD 3/14.

▲† **Tex., Lackland Air Base (Br. San Antonio)**—FACILITIES—U. S. Eng., 606 Santa Fe Bldg., Galveston, plans by DeHaven Pitts, Travis Bldg., San Antonio, water lines, facilities, **$500,000;** sanitary sewers, **$450,000,** electric power facilities, area lighting, etc. **$275,000,** Wm. Orrison Engineers, Travis Bldg., San Antonio, consult. engrs.; plans by Shoop & Roberts, 122 Olmos Dr. West, San Antonio, warehouses, Approx. **$2,500,000.** CD 2/1.

▲ † **Wash., Moses Lake**—BARRACKS, etc.—U. S. Eng., 4735 E. Maginal Way, Seattle 4, Wash., plans by Naramore, Bain, Brady & Johanson, 904 7 Ave., Seattle, barracks, **$3,400 000;** plans by G. W. Stoddard & Assocs., 1213 Westlake Ave. N., Seattle, hospital, **$835,000;** at Larson Air Force Base Lt. Col. J. P. Buehler, dist. engr.

▲† **Alaska**—AIR FORCE BASE IMPRVS.—U. S. Eng. (APO 942, c/o PM, Seattle, Wash.), Anchorage, air force utilities, **$3,000,000.** L. Bouillon & Assoc., 1411 4th Ave., Seattle 1, Wash., engrs.; army utilities, **$1,000,000,** ammunition storage, **$350,000,** Stevens & Koon, Spalding Bldg., Portland, Ore., engrs.; plans by Jones & Bindon, Hoge Bldg., Seattle 4, Wash., special maintennce shop, **$300,000;** ordnance shop, **$400,000;** plans by H. Johnston, Concord Bldg., Portland, Ore., gymnasium, **$800,000;** plans by L. A. Thomas, Equitable Bldg., Portland, Ore., maintenance shops, **$1,250,000,** all foregoing at Eielson Air Force Base. CD 11/27.

▲† **Alaska**—AIR FORCE BASE IMPRVS.—U. S. Eng. (APO 942, c/o PM, Seattle, Wash.), Anchorage, utilities, **$2,700,000,** ammunition storage, **$350,000,** Stevens & Koon, Spalding Bldg., Portland, Ore., consult. engr.; plans by Naramore, Bain, Brady & Johanson, 904 7 Ave., Seattle 4, Wash., battalion headquarters and supply bldgs., **$257,000;** plans by V. N. Jones & Assoc., Republic Bldg., Seattle 1, Wash., fire station, **$275,000;** plans by Jones & Bindon, Hoge Bldg., Seattle 4, Wash., field maintenance shop, **$125,000;** artillery shop, **$520,000;** plans by J. Johnston, Concord Bldg., Portland, Ore., gymnasium, **$808,000;** plans by G. Stanton, Concord Bldg., Portland, Ore., infirmary, **$164,000,** all foregoing at Ladd Air Force Base. CD 11/27.

▲† **Alaska, Anchorage**—CAR and COACH REPAIR SHED, etc.—The Alaska Railroad, Dpt. Interior, Anchorage, car and coach repair shed, **$1,000,000;** wheel shop, **$1,000,000;** battery shop, **$1,000,000;** general repair shop, **$500,000;** paint shop, **$500,000;** blacksmith shop, **$500,000** to replace structures destroyed by fire.

▲† **Alaska, Fort Richardson**—LAUNDRY and DRY CLEANING, etc.—U. S. Eng. (APO 942, c/o PM, Seattle, Wash.), Anchorage, plans by V. N. Jones & Assoc., Republic Bldg., Seattle 1, Wash., lanudry and dry cleaning bldg., **$2,000,000;** plans by Jones & Bindon, Hoge Bldg., Seattle 4, Wash., field maintenance shop, **$800,000;** plans by Naramore, Bain, Brady & Johanson, 904 7th Ave., Seattle 4, Wash., battalion headquarters and supply bldgs., **$400,000;** composite administration bldg., **$1,350,000;** plans by George M. Rasque & Sons, Washington Trust Bldg., Spokane, Wash., bakery, **$400,000;** plans by P. Belluschi, 2040 S. W. Jefferson St., Portland, Ore., indoor training facilities, **$2,600,000;** plans by Lawrence, Tucker & Wallman, Failing Bldg., Portland, Ore., post engineer facility, **$900,000,** paint and dope storage warehouse warehouse, **$44,000;** plans by Foss, Malcolm & Olsen, Juneau, officer's mess, **$400,000;** plans by Manley & Mayer, Anchorage, telephone exchange, **$320,000;** railroad classfiication yard, **$900,000,** L. Bouillon & Assoc., 1411 4th Ave., Seattle 1, Wash., consult. engrs.; storage, **$500,000,** Stevens & Koon, Spalding Bldg., Portland, Ore., consult. engrs. CD 11/27.

▲† **Alaska, Whittier**—PLANT—U. S. Eng., (APO 942, c/o PM, Seattle, Wash.), Anchorage, heat and power plant. **$1,500,000.** Bechtel Corp., 220 Bush St. San Francisco, Calif., consult. engrs. CD 3/31.

Mexico, San Luis Potosi—Nacional Financiera, S.A.V. Carranza 25, Mexico City, plans meat packing house. **$750,000.**

PUBLIC BUILDINGS

▲† **Ala., Tuscumbia**—ELECTRIC POWER PLANT—Tennessee Valley Auth., New Sprankle Bldg., Knoxville, Tenn., electric power plant. **$47,000,000.**

Calif., San Diego—JUVENILE HALL—Bd. Supervs., San Diego Co., Civic Center Bldg., plans by George Lykos, Spreckles Bldg., Anthony Home Juvenile Center. **$875,000.** CD 11/16.

Conn., Danbury—SCHOOL—Town, Walter P. Sweet, supt. Schools, plans by William W. Sunderland, 81 West St., school to replace Locust Ave. School to be used for training students at the college, Roberts Ave. **$700,000.**

Conn., Rocky Hill—SCHOOL—Town Bd. Educ., Junior High School. **$800,000.**

▲ **Ga., Augusta**—HOSPITAL—State, State Office Bldg., Atlanta, plans by Gregson & Ellis, Mortgage Guarantee Bldg., Atlanta, state hospital. **$12,000,000.** CD 12/26.

▲ **Idaho, Blackfoot**—SCHOOL—School Bd., Blackfoot, voted $685,000 bonds, high school, **$1,000,000;** and adding 10 classrooms to 3 elementary schools, **$300,000.** CD 3/7.

▲ **Ill., Chicago**—HOSPITAL—State, 160 N. LaSalle St., Chicago, Zone 1, plans by C. Herrick Hammond, 53 W. Jackson St., Zone 4, mental hospital on grounds of State Mental Hospital at Dunning-Irving Park and Narragansett Sts., Zone 34, **$10,000,000.**

▲ **Ill., Chicago**—SCHOOLS—Bd. Educ., 228 N. LaSalle St., Chicago, Zone 1, plans by John C. Christensen, c/o owner, 228 N. LaSalle St., Zone 1,
Washington Grade School replacement, **$1,250,000.**
grade school at 52 St. and Avers Ave., **$350,000.**
grade school at 80 and Maplewood Sts., **$750,000.**
grade school at 72 and Spaulding Sts., **$350,000.**
grade school at 93 and Wallace Sts., **$750,000.**
grade school at 93 and Princeton Sts., **$750,000.**
grade school at 31 St. and South Park Ave., **$750,000.**
grade school at 64 and Tripp Sts., **$750,000.**
grade school at 72 St. and Wabash Ave., **$750,000.**
high school at Hiawatha and Kilpatrick Sts., **$1,750,000.**
high school near 70 and Springfield Sts., **$1,500,000.**
vocational school, 1225 N. Sedgwick St., **$2,000,000.**
grade school at Rosemont, Avers and Hamilin Sts., **$350,000.**
grade and high school at Ave. O and 114 St., **$1,750,000.**
grade school, 70 and Hamlin Sts., **$350,000.**
5 new schools, to serve new housing projects, **$5,825,000.**
McKinley High School addn., 2040 Adams St., Zone 21, **$1,800,000.**
Drake Grade School addn., 2641 Calumet Ave., Zone 16, **$1,000,000.**
Owen Grade School addn., 8247 S. Christiania St., Zone 20.
Brown Grade School replacement, 1758 Warren Ave., **$1,500,000.**
commercial high school, **$1,000,000.**
Crane Technical High School addn., 2245 Jackson Blvd., Zone 7, **$550,000.**
Dunbar Vocational School, **$3,500,000.**
Grant Grade School addn., 2433 Wilcox St., Zone 12, **$525,000.**
Harrison Technical High School, 2850 W. 24 St., **$1,200,000.**
Haven Grade School replacement, 1472 S. Wabash Ave., **$800,000.**
Hawthorne Grade School, 330 N. Seminary St., Zone 13, **$700,000.**
Hendricks School, 343 W. 43 St., **$1,000,000.**
Jenner Grade School, 1009 N. Cleveland St., Zone 10, **$600,000.**
Newberry Grade School, 7000 Willow St., **$800,000.**
Shakespeare School replacement, 1119 E. 46 St., **$650,000.**
Skinner School replacement, 1070 Jackson Blvd., **$1,000,000.**
South Side School for handicapped pupils, **$550,000.**
J N Thorp Grade School, 8914 Buffalo Ave., **$600,000.**
Tilden Technical High School, rehailitation, addns., 4747 S. Union St., **$500,000.** CD 3/30/45.

Ill., Madison — DWELLING UNITS — Madison County Housing Auth., Madison, plans by Friedman, Alschuler & Sincere, 23 Jackson St., Chicago, Zone 6, 85 dwelling units. **$800,000.**

▲ **Ind., Indianapolis**—HOMES—Leader Homes, Inc., 415 E. Washington St., 300 homes near new industries at 38 and Arlington Aves. **$3,000,000.**

▲ **Ky., Louisville**—LIBRARY, etc.—University of Louisville, 2301 S. 3 St., plans by Nevin & Morgan, Starks Bldg., library, **$400,000;** natural science bldg., **$800,000.** E. R. Ronald & Assoc., 554 S. 3 St., consult. engrs.

▲ **Md., Easton**—HOSPITAL—Memorial Hospital, S. Washington St., plans by Jas R. Edmunds Jr., 130 W. Hamilton St., Baltimore, 4 story, brick, steel Easton Memorial Hospital addn., incl. power plant, **$1,000,000.**

Mass., Amesbury—SCHOOL—Town School Dpt., School St., plans by Clinton F. Goodwin, 25 Washington Sq., Haverhill, 60x100x285 ft., brick, U-shaped Consolidated Elementary and High School. **$900,000.** CD 12/2/49.

▲ **Mass., Boston**—HOUSING—City of Boston Housing Auth., 230 Congress St., plans by Robert W. Blaisdell, 71 Proctor St., Roxbury, 3 story, bsmnt., brick, concrete, 150 housing units, Forest Hills sect., Jamaica Plain. **$1,500,000.** CD 12/15/48.

▲† **Mass., Natick**—RESEARCH LABORATORY—Dpt. Army, Army Base, 666 Summer St., Boston, plans by The Ballinger Co., 105 S. 12 St., Phila., Pa., quartermaster research laboratory, Lake Cochituate. **$15,000,000.** CD 3/14.

▲ **Mass., North Adams**—HOSPITAL—North Adams Hospital, Hospital Ave., plans by Leland & Larson, 814 Statler Bldg., Boston, hospital rear of present bldg., Hospital Ave. **$1,500,000.** CD 9/9/46.

▲ **Mich., Corunna**—HOSPITAL—Bd. Suprvs., Shlawassee Co. Hary Kurrie, welfare dir., plans by Clark R. Ackley, 1811 E. Michigan Ave., Lansing, brick, steel, concrete County Hospital, **$1,000,000.**

▲ **Mich., Kalamazoo**—SERVICE—State, A. N. Langlus, dir. Bldg. Dpt., Lansing, brick, steel, concrete service bldg. at Kalamazoo State Mental Hospital. **$1,286,000.** CD 1/18/50.

▲ **Mont., Billings**—SCHOOLS—School Dist. 2, voted **$1,600,000** bonds, new school facilities, remodeling and addns. to existing schools. CD 2/19.

▲ **Mont., Missoula**—DORMITORY, etc.—State Bd. Educ., Helena, dormitory, **$625,000;** humanities classroom bldg., **$1,000,000;** music bldg., **$700,000,** at State University. CD 9/13/45.

Neb., Omaha—HEADQUARTERS—Omaha Public Power Dist., 17 and Harney Sts., service headquarters bldg. **$825,000.** C. W. Minard, c/o owner, ch. engr.

▲ **Neb., Omaha**—SCHOOLS—Bd. Educ., 3902 Davenport St., plans by L. A. Daly Co., Insurance Bldg., school, 60 and Walnut Sts., **$879,210;** plans by N. S. Wallace, Omaha Natl. Bank Bldg., school, 66 and Western Ave., **$556,000.** CD 2/27.

▲ **Neb., Omaha**—HOUSING—Omaha Housing Auth., 5529 S. 30 St. plans by L. A. Daly Co., Insurance Bldg., 300 housing units, 30 and Burdette Sts. **$3,500,000.**

▲ **N. J., Atlantic City**—HOUSING—Atlantic City Housing Auth., plans by A. L. Brooks, 1616 Pacific Ave., Atlantic City, and Churchill & Fulmer, 19 W. 4 St., New York, N. Y., housing. **$2,500,000.**

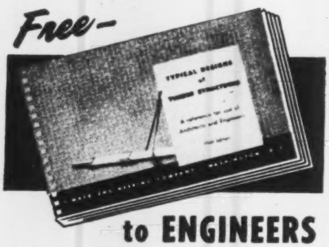
N. J., Burlington—HOUSING—Burlington Housing Auth., Stone Villa, Burlington, plans by Henry W. Petty, 141 Chestnut St., Moorestown, 17 three-story apartments, Clarkson St. between St. Mary's St. and Assiscunk Creek, **$800,000.** CD 10/13/49.

▲ **N. Y., Brooklyn**—HOUSES—New York City Housing Auth., 63 Park Row, New York Zone 7, plans by Kelly & Gruzen, 80 Fifth Ave., New York, Zone 3, Van Dyke Houses; 11 fourteen story bldgs. for 1,453 families on 22½ acre site bounded by Stone, Sutter, Powell and Livonia Sts. **$14,530,000.** CD 9/8.

▲ **O., Parma**—HIGH SCHOOL—Bd. Educ., Parma, **$2,850,000** bond election May 8, second unit of high school, W. 54 St. and Longwood Ave., to provide 1700-seat auditorium, 2,000-seat gymnasium, library, theater, offices, etc. CD 1/27/50.

▲ **O., Steubenville**—COURT HOUSE, etc.—Comrs. Jefferson Co., Court House, **$3,000,000** bond election May 8, court house and jail.

▲ **Tenn., Knoxville**—DORMITORY—State Dpt. Institutions, State Office Bldg., Nashville, dormitory at Eastern State Hospital. **$1,000,000.**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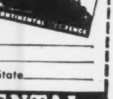

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▲ **Tex., El Paso**—HOUSING—El Paso Housing Auth., El Paso, plans by Louis L. McIlinary, 701 Caples Bldg., First Phase, 30 Negro housing units, **$300,000;** Second Phase, 300 housing units, **$2,200,000;** Third Phase, 330 housing units, **$2,410,000.** CD 3/16.

▲† **Tex., Wichita Falls**—HOSPITAL—U. S. Eng., 1127 Texas and Pacific Bldg., Fort Worth, 525-bed hospital adn. at Shepherd Air Base. **$6,000,000.**

▲ **Wash., Bremerton**—HOUSING—Bremerton Housing Auth., Bremerton, 3,000 housing units **$20,000,000.**

▲ **Wash., Renton**—SCHOOLS—School Dist. 403, Renton, plans by Mallis & De Hart, Lyons Bldg., Seattle, Zone 4, North Highland School, **$800,000;** Spring Glen School, **$300,000.** CD 3/8.

▲ **Ont., Chatham**—PUBLIC—Dpt. P. Wks., Hunter Bldg., Ottawa, Ont., federal public building, Wellington St. W. **$1,000,000.**

▲ **Ont., London**—MEDICAL, etc.—Dpt. Veterans, Ottawa, medical and administration bldg. at Westminster Soldier's Hospital. **$4,000,000.** CD 7/11/49.

▲ **Ont., Ottawa**—HEADQUARTERS—Defence Constr. Ltd., Ottawa, National Defence Headquarters on Base Line Rd. near Pine Crest Cemetery. Underground headquarters to be considered by Dpt. National Defence. Approx. **$16,000,000.**

Que., St. Hyacinthe—VETERINARY SCHOOL—Dpt. Agriculture, (Prov. Govt.) Quebec City, veterinary school (Provinical School of Veterinary Medicine). Approx. **$850,000.** CD 4/24/47.

▲ **Que., St. Johns**—BARRACK BLOCK—Defense Constr. Ltd., 1247 Guy St., Montreal, 2,000 men—barrack blocks, Approx. **$1,500,000.**

COMMERCIAL BUILDINGS

▲ **Calif., Fallbrook**—HOUSING—Eleventh Naval Dist., P. Wks. Bldg., San Diego, plans by John N. Douglas, 1041 E. Green St., Pasadena, construct, manage and finance 562-unit housing, at Camp Pendleton, Approx. **$1,000,000.**

▲ **Calif., San Diego**—HOSPITAL—San Diego Hospital Assoc., 1041 7 Ave., 300-bed hospital. **$3,500,000.** Stone & Mulloy & S. P. Marraccini, 619 California St., San Francisco, archts. Johnson, Hatch & Wulf & Frank Hope, c/o owner, staff engrs.

▲ **Calif., San Francisco**—APARTMENT—Webb & Knapp, Inc., 383 Madison Ave., N. Y., 17, N. Y., 20 story apartment, on site bounded by Priest, Clay, Jones and California Sts. **$2,000,000.**

▲ **Ill., Chicago**—HOSPITAL—Louis A. Weiss Memorial Hospital, c/o Loebl, Schlossman & Bennett, archts., 333 N. Michigan St., Zone 1, 2 and 4 story, 250-bed hospital, Marine Dr. between Leland and Eastwood Sts. **$2,500,000.**

▲ **Mass., Framingham** — HOSPITAL — Union Hospital, Evergreen St., plans by Ellerbe & Co., 505 First National Bank Bldg., St. Paul, Minn., hospital addn., alterations, Evergreen St. **$1,000,000.**

▲ **Mass., Wellesley** — DORMITORY — Wellesley College, Supt. Bldg., President's Office, plans by Coolidge, Shepley, Bulfinch & Abbott, 1 Court St., Boston, 4 story, bsmnt., 2 wing, brick, steel dormitory group. **$2,250,000.**

▲ **Mich., Detroit**—CHURCH—Westminister Presbyterian Parish, Rev. Dr. John Arthur Visser, 9851 Hamilton St., 1 story bsmnt., brick, stone church, Outer Dr. and Hubbell St. **$1,000,000.** CD 3/18/47.

▲ **Mich., Midland**—HOSPITAL—Midland Hospital, Leo Bliss, chn., brick, steel, concrete hospital, **$1,200,000.**

▲ **Mo., St. Louis**—HOTEL—Hotel Jefferson Co., 12 and Locust Sts., and Hilton Hotels Corp., Conrad Hilton, pres., 693 S. Commonwealth St., Los Angeles, Calif., modernization looby, rooms and fronts of bldg. incl. kitchen and laundry, exten. air-conditioning sys., etc. **$1,500,000.**

▲ **Mont., Great Falls**—HOUSING—U. S. Eng., 4735 E. Marginal Way, Seattle 4, Wash., plans by A. V. McIver & Assoc., Strain Bldg., construct, manage, finance 400 housing unit at Great Falls Air Force Base. **$3,500,000.**

▲ **Neb., Sidney**—HOUSING—U. S. Eng., P. O. Box 1216, Farm Credit Bldg., 206 8 19 St., Omaha Zone 1, construct, finance, manage 100 living units, Sioux Ordnance Depot. **$1,000,000.**

▲ **Pa., Pittsburgh**—APARTMENT—Noble Manor Apartments, Inc., 6663 Forest Glenn Rd., plans by Philip Friedman, 121 S. Negley St., 20 brick, block apartments. **$2,000,000.**

▲ **Tex., Houston**—RESIDENCES—Adams & Co., 4001 Westheimer St., residential project. **$1,750,000.**

▲ **Tex., Houston**—APARTMENT—Lyons Gardens Apartments, 2300 Bkl. Lyons Ave., plans by Joseph B. Reynolds, 2518 Times St. 250 masonry apartment units, in area off Lyons Ave. **$1,250,000.** R. C. Saner, 2518 Times St., consult. engr.

▲ **Tex., Tyler**—HOTEL—Hotel Group, c/o Wilton Daniel, chrn., Tyler, plans by Design, Inc., 906 Sidney St., St. Louis Mo., hotel, S. Broadway and Elm St. **$1,000,000.**

▲ **Tex., Waco**—Y.M.C.A. BLDG.—Young Mens' Christian Assoc., Box 949, Waco, plans by Walter Cocke, Jr. & Co., 1501 Franklin St., 5 story, bsmnt. frame, brick veneer YMCA bldg., concrete pier and beam fdn., rein.-con. swimming pool, etc. **$1,000,000.**

▲ **Wis., Milwaukee**—APARTMENT—Avenue Investment Co., 4308 W. Forest Home Ave., plans by F. J. Hinton, 828 N. Broadway, Zone 2, 8 story, 180x180 ft., steel, concrete 300 unit apartment. **$3,600,000.**

▲ **Ont., Ottawa**—APARTMENTS—Riverside Terrace Ltd., c/o Central Mortgage Housing Corp., Ottawa, Ont., 26 apartment bldgs. incl. 156 units, six apartments in each bldg. just west of Island Park Dr. near Champlain Bridge. Approx. **$1,000,000.**

▲ **Que., Quebec City**—HOUSES—Habitations Ouvrieres, c/o G. Aymot, archt., to Belvedere Ave., Quebec City, 500 houses on property of General Hospital, St. Sauveur Ward. Approx. **$3,000,000.**

▲ **Que., Shawinigan Falls**—SEMINARY—Seminary Ste. Marie, 7 Cedars St., plans by A. Lacoursiere, 101 4 St., 4 story, 63x300 ft. and 59x61 ft., concrete, brick, stone seminiary. **$1,000,000.**

INDUSTRIAL BUILDINGS

▲ **Ill., Aurora**—PLANT—Electric Storage Battery Co., 19 St. and Allegheny Ave., Phila., Pa., battery plant, **$1,000,000.**

▲ **Ill., Crystal Lake**—FACTORY, etc.—Harnischfeger Corp., 4460 W. National Ave., Milwaukee, Wis., 1 story factory and office, on 80 acres of land, **$1,000,000.**

▲ **Ia., Bettendorf**—PLANT EXPANSION—Riverside Foundry, Bettendorf Russell Schwartz, pres., plant expansion, **$2,000,000.**

▲ **Ia., Burlington**—PLANT—Sylvania Electric Products Inc., C. A. Haines, genl. mgr.. 1740 Broadway, New York, N. Y., mfg. plant. **$1,500 000.**

▲ **Ia., Eddyville** — POWER STATION — Iowa Southern Utilities Co., Edward L. Shutts, pres., Centerville, power station, near here. **$8,000,000.** Edward de Rivera, The Pioneer Service & Eng. Co., 231 S. La Salle St., Chicago, Ill., consult. engr. CD 2/26.

Ky., Lebanon—PLANT—Handmacher Vogel Co., 533 7 Ave., New York, N. Y., plans by Edd R. Gregg, Heyburn Bldg., Louisville, Zone 2, 48,000 sq. ft. mfg. plant, **$550,000.**

Ky., Louisville—PLANT—Stratton & Terstegge Co., 1501 W. Main St., plans by Jos. H. Kolbrook, Starks Bldg., 5 story, 75,000 sq. ft. plant addn. **$800,000.** E. R. Ronald & Assoc., 554 S. 3 St., consult. engrs.

Mass., West Springfield—PLANT—Western Massachusetts Electric Co., 73 State St., Springfield. 57x208 ft., brick, steel, concrete plant addn. **$750,000.**

▲ **Mass., Natick**—PLANT—Martin Cerel, 18 E. Central St., 8 story center bldg. with 1 story wings, 100,000 sq. ft. radar plant, Lake Cochituate Laboratory. **$2,000,000.** Electronics, Inc., 11 Leon St., Roxbury, consult. engrs.

▲ **Mass., Woburn**—FACTORY—Sylvania Electric Products, 70 Forsyth St., Boston, plans by Thomas Worcester, 84 State St., Boston, 1 story, brick steel, 100,000 sq. ft. factory, North Woburn. **$1,000,000.** CD 3/12.

▲ **Mich., Monroe**—FACTORY—Gould-National Batteries, Inc., Monroe, 88,000 sq. ft. floor space battery factory on 21 acre tract on Telepgraph Rd. south of New York Central R.R. tracks, near here, **$1,000,000.**

Mo., Independence—PLANT—National Aluminum & Brass Fdry., Inc., 1311 W. Elm St., plant on 15 acre site, Noland Rd. **$500,000.**

▲ **N. J., Riverton**—PLANT—Swedish Spong Iron & Metal Powder Corp., 545 Fifth Ave., New York, N. Y., metal products plant. **$4,000,000.**

N. Y., Forest Hills—WAREHOUSE—McKesson & Robbins, Inc., 155 E. 44 St., New York 17, N. Y., plans by Chapman, Evans & Delehanty, 50 Broadway, New York, Zone 4, warehouse and office. **$650,000.**

▲ **O., Athens**—GENERATING UNITS—Columbus & Southern Ohio Electric Co., 215 N. Front St., Columbus, install two 60,000 kw generating units at E. M. Poston power station, near here. **$26,500,000.**

▲ **O., Canton**—ELECTRIC FURNACES—Timken Roller Bearing Co., 1835 Dueber Ave. S.W., electric furnaces for steel production. **$5,503,000.**

O., Columbus—TERMINAL—Standard Oil Co. of Ohio, Midland Bldg., Cleveland, pipe line terminal on west side of Columbus. **$500,000-$1,000,000.**

▲ **O., Miamisburg**—GENERATORS, etc.—Dayton Power & Light Co., Gas and Electric Bldg., Dayton, install two 60,000 kw. generators in new sect. Hutchings station; extend 66,000 volt power line from Terminus at Xenia to Washington Court House; extend 66,000-volt line from Waynesville to Wilmington; extend. 66,000-volt line from Crown Station in Dayton to West Manchester; change present 33,000-volt line serving St. Marys, Celina and Coldwater to 66,000-volt. Total cost **$30,000,000.**

▲ **Pa., Morrisville**—PLANT—General Refractories Co., 1520 Locust St., Phila., plant for mfg. silica refractories on 58-acre tract along Delaware River. **$3,000,000.** Frederick Miller, 1520 Locust St., Phila., engr. CD 3/16.

▲ **R. I., Westerly**—GENERATING PLANT—Narragansett Electric Co., 49 Westminster St., Providence, generating plant, 5 000 kw-5 diesel electric generators electric and auxiliary equip. off Bradford Rd. **$1,000,000.** Charles A. Maguire Assoc., 1015 Turks Head Bldg., Providence, consult. engrs. CD 9/29/43.

Tex., Fort Worth—PLANT—Armour & Co., North Fort Worth, blood processing plant. **$850 000.**

▲ **Tex., Houston**—PLANT—Pure Oil Co., 1st Natl. Bank Bldg. addnl. plant expansion for production components required in mfg. aviation gasoline. **$2,000,000.**

▲ **Tex., Levelland**—PLANT—Levelland Refining Co., Levelland, aviation gasoline plant, **$2,441,763.**

▲ **Tex., Longview**—PLANT—Tennessee Eastern Corp., Longview, ethyl alcohol, synthetic units. **$5,787,000.**

Tex., Odessa—PLANT—Hutchison Pipe & Waster Materials Co., Odessa, steel scrap plant expansion. **$100,000.**

▲ **Tex., Phillips**—REFINERY—Phillips Petroleum Co., Phillips, new propane and butane refinery. **$4,056,575.**

▲ **Tex., Port Arthur**—REFINERY—Gulf Oil Corp., Port Arthur, Tex., refinery plant. **$18,485,342.**

▲ **Tex., Texas City**—REFINERY—Pan-American Refining Co., Texas City, addnl. benzene and products refinery unit. **$1,100,000.** CD 1/25, under LB.

▲ **Utah, Woods Cross**—CRACKING UNIT—Phillips Petroleum Co., W. W. Keeler, vice pres., Bartlesville, Okla., 10,000 bbl. catalytic cracking unit approx. 4 mi. north of Salt Lake City. **$10,000,000.**

Va., Galax—PLANT—Vaughn-Bassett Furniture Co., Galex, Va., rebuild plant. Approx. **$500,000.**

▲ **Wis., Manitowoc**—PLANT—Manitowoc Portland Cement Co., Manitowoc, 340 ft. long kiln, 300 ft. concrete stack, cement plant addn., **$2,500,000.**

▲ **B. C., Vancouver**—PLANT—British American Oil Co., Ltd., Bay and College Sts., Toronto, Ont., catalytic cracking PLANT for high octane gasoline and lubricating oils on Burrard Inlet, near here. **$10,000,000.**

Ont., Hamilton — PLANT — Canadian Westinghouse Co. Ltd., 286 Sanford Ave. N., Hamilton, Ont. Plans by Prack & Prack, 310 Main St. E., Hamilton, Ont. palnt exten., incl. laboratory facilities exten. Approx. **$700,000.** W. R. Souter & Assocs., 914 Pigott Bldg., archts.

▲ **Ont., Kapuskasing**—PLANT—Spruce Falls Power & Paper Co., Ltd., Kapuskasing, Ont., paper mill plant expansion and modernization to increase output newsprint 12,000 tons annually. **$5,000,000.** CD 2/12/47.

Que., Montreal—PLANT—Canadian Tube & Steel Products Ltd., 5765 Hamilton St., plant addn., **$750,000.** CD 1/16/46.

UNCLASSIFIED

▲ **Ark., Mena**—GAS TRANSMISSION LINE—City, bond election Apr. 10, constr. gas transmission line from DeQueen to Mena, **$1,350,000.**

Kansas—RURAL DISTRIBUTION LINES—Jewell Mitchell Electric Co-operative, Mankato, 519 mi. rural distr. lines, sys. imprvs., Jewell Co. **$960,000.**

▲† **Maine**—PIPE LINE—Dpt. Navy, First Naval Dist. Headquarters, 495 Summer St., Boston, Mass., pipe line from Long Island, Portland Naval Base to Brunswick Navy Air Station. **$30,000,000.**

▲ **Minnesota**—RURAL TELEPHONE SYSTEM—Garden Valley Telephone Co., Bagley, imprv., expansion rural telephone svs. in northwest Minnesota, serving Polk, Red Lake, Pennington, Marshall, Mahnomen and Clearwater Counties; construct 482 mi. rural distr. lines, rebuild 1,275 mi. existing line, convert 18 manual exchanges to dial, install 5 new dial exchanges, etc. **$2,065,000.**

▲ **Missouri**—RURAL DISTRIBUTION LINES — Citizens Electric Corp., Ste. Genevieve, 62 mi. rural distr. lines, 3 mi. tie lines, 43 mi. transmission lines, 2 sub-stations, Ste. Genevieve Co. **$1,360,000,** C. J. Kietting, 260 Merchant St., Ste. Genevieve, owner's engr. Drazen & Assoc., 8135 Forsythe Blvd., St. Louis, consult. engrs. CD 3/14.

Montana — RURAL DISTRIBUTION LINES — Flathead Electric Co-operative, Kalispell, 212 mi. rural distr. lines, irrigation loads, sys. imprvs., Flathead Co., **$755,000.** H. J. Ferguson, Kalispell, owner's engr. General Engineers, Moose Bldg., Missoula, consult. engrs. CD 6/18/48.

▲ **New York and New Jersey**—TUNNEL—Port of New York Auth., 111 8th Ave., New York 11, N. Y., third tube for Lincoln Tunnel under Hudson River from New York, N. Y., to Weehawken, N. J., **$85,000,000.**

▲ **Ohio**—TRANSMISSION SYSTEM—Columbus & Southern Ohio Electric Co., 215 N. Front St., Columbus, imprv., expansion transmission sys., **$14,500,000;** extend and imprv. distr. sys., **$11,500,000;** misc. imprvs., **$2,500,000.**

▲ **O., Akron**—COMMUNITY RECREATION CENTERS, etc.—City, Arthur Genter, supt. Recreation, community recreation centers at Mason, Thornton and Prentiss Parks, **$100,000** each, shelter houses for Kerr and Hentiz Parks; enlarge Perkins Woods Community Center; resurface tennis courts, addnl. parking facilities, lighting, etc. Approx. **$1,000,000.**

Tex., Orange — DOCKS — Levington Shipbuilding Co., Orange, docks, imprvs., expansion. **$580,000.**

† **Washington**—TRANSMISSION LINE—**Boneville Power** Admin., P. O. Box 3537, **Portland, Ore.,** addnl. 115-kv transmission line **Bremerton to Allyn,** Kitsap and Mason Counties. **$890,000.**

† **Wash., Auburn**—SPRINKLER SYSTEM—Dpt. Army, Pentagon Bldg., Wash., D. C., sprinkler sys. at Auburn General Depot. **$500,000.**

▲† **Alaska, Fort Richardson**—OIL LINE—U. S. Eng. (APO 942, c/o PM, Seattle, Wash.) Anchorage, plans by Knappen Tippetts Abbett Eng. Co., Flood Bldg., San Francisco, Calif., oil line installation and unloading facilities. **$1,900,000.** CD 11/27.

† **Alaska, Whittier**—UTILITIES—U. S. Eng., (APO 942, c/o PM, Seattle, Wash.) Anchorage, outside utilities. **$900,000.** L. Bouillon & Assoc., 1411 4th Ave., Seattle 1, Wash., consult. engrs. CD 11/27.

Alberta—GAS TRANSMISSION LINE—Canadian Western **Natural** Gas. Co. Ltd., Turner Valley, 12 in. **gas transmission line** from Turner Valley to Calgary. **$750,000.**

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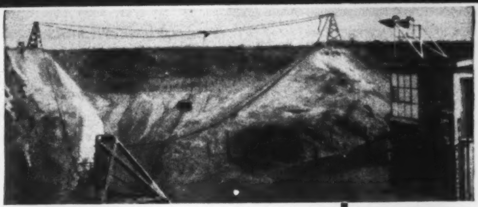

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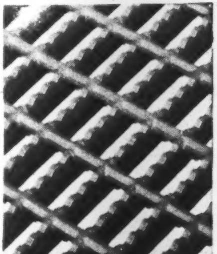

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CONSTRUCTION REPORTS-Second Section

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BIDS ASKED—HEAVY CONSTRUCTION

STATE HIGHWAY LETTINGS
BRIDGES
April 10
Massachusetts
April 12
Massachusetts
April 17
Massachusetts
STREETS AND ROADS
April 10
Massachusetts

BIDS ASKED—BUILDINGS

▲ **Mass., Adams**—SCHOOL—B.A. 4/12—Town, School Dpt., Commercial St., Senior High School. $1,200,000. CD 12/21.

LOW BIDDERS—HEAVY CONSTRUCTION

▲ **Thomas R. Rawson, Inc.**, 891 Main St., Boston, Mass. Low Bidder. **$1,971,829.** Reconstr., relocation Berkshire Trail 6.27 mi., Dalton and Windsor, MASSACHUSETTS. State Pub. Wks. Dpt., Boston, Mass. Bids Mar. 20. CD 3/7.

LOW BIDDERS—BUILDINGS

▲ **Daniel Cunningham Co., Inc.**, 20 Kilby St., Boston, Mass. Low Bidder. **$1,369,985.** Maternity and pediatric bldg. at HOSPITAL, Varnum Ave., LOWELL, MASS. Lowell General Hospital, 295 Varnum Ave., Lowell, Mass. Bids Mar. 15. CD 2/23.

▲ **Vara Constr. Co., Inc.**, 718 Huntington Ave., Roxbury, Mass. Low Bidder. **$1,181,760.** Alternate A Minus $3,460; **$1,174,760** Alternat B Minus $100. M 201 Contr. I BLDG. for Psychotic Children, Metropolitan State HOSPITAL, WALTHAM, MASS. State Dpt. Mental Health, 15 Ashburton St., Boston, Mass. Bids Mar. 22. CD 3/12.

▲ **Town**, Town Hall, South Kingston, R. I., rejected bids Feb. 20, HIGH SCHOOL, SOUTH KINGSTON, R. I. L. B. **$1,424,000.** CD 2/27, under LB.

CONTRACTS—HEAVY CONSTRUCTION

▲† **W. H. Hinman, Inc., and Associated Pipe Line Corp.**, 58 Main St., Westbrook, Me. Contract Awarded. **$4,000,000.** petroleum pipe line, MAINE. Dpt. Air Force, The Pentagon, Wash., D. C. CD 3/5, under LB.

▲ **Stone & Webster Engineering Co.**, 90 Broad St., New York 4, New York. Contract Awarded. **$6 000,000.** Design and construct hydro-electric proj. at Ripogenus Dam on Penobscot River, MILLINOCKET, ME. Great Northern Paper Co., 6 State St., Bangor, Me.

CONTRACTS—BUILDINGS

▲ **J. G. Roy & Sons Co.**, 21 Silver St., Springfield, Mass. Contract Awarded. **$1 250,000.** Maternity HOSPITAL, Pratt St., SPRINGFIELD, MASS. Wesson Maternity Hospital, 120 High St., Springfield, Mass. Awarded Mar. 12. CD 3/20, under LB.

MIDDLE ATLANTIC

BIDS ASKED—HEAVY CONSTRUCTION

STATE HIGHWAY LETTINGS
STREETS AND ROADS
April 11
New York
April 20
Pennsylvania

BIDS ASKED—BUILDINGS

▲ **N. J., Summit**—HOSPITAL—B.A. About April—Overlook Hospital, Summit, two 6 story hospital wing addns., bordering Morris Ave., $2,000,000. John J. Kentz Co., 382 Springfield Ave., Summit, engr. Eggers & Higgins, 100E. 42 St., New York, N. Y., archts. CD 12/18/47.

Pa., State College—PHYSICAL EDUCATION—B.A. 4/11—General State Auth., 18 and Herr Sts., Harrisburg, addnl. sect. Physical Education Bldg. at Pennsylvania State College. $700,000. Plans deposit $15. Trautwein & Howard, 1411 Walnut St., Phila. archts. A. F. Jones, c/o owner, engr. CD 3/21, under LB.

N. J., Bound Brook—SCHOOL—B. A. 4/12—Bd. Educ., 50 W. High St., Smalley School, Cherry Ave. $500,000. CD 6/19.

LOW BIDDERS—BUILDINGS

▲† **George Hyman Constr. Co.**, 1010 Vermont Ave. N.W., Wash., D. C. Low Bidder. **$7,200,000.** DOMICILIARY BLDG. for Soldiers Home, CIVENG 49-080-51-34, WASH., D. C. U. S. Eng., First and Douglas Sts. N.W., Wash., 25, D. C. Bids Mar. 15. CD 3/6.

CONTRACTS—HEAVY CONSTRUCTION

▲ **Ole Hansen & Sons, Inc.**, Old Turnpike and Franklin Ave., Pleasantville, N. J. Contract Awarded. **$1,034,673.** 5 bridges, approaches at Magnolia Ave., Toms River, C. R. R. of N. J., Lakehurst Rd. and Rte. 37, Route 4, Parkway, Sect. 21A, Berkeley, and Dover Twps., Ocean Co., NEW JERSEY. State Hy. Dpt., Trenton, N. J. Bids Mar. 13, awarded Mar. 15. CD 3/19, under LB.

▲† **George Hyman Constr. Co.**, 1010 Vermont Ave. N.W., Wash., D. C. Contract Awarded. $7,200,000. Domiciliary Bldg. for soldiers home, CIVENG 49-080-51-34, Wash., D. C. U. S. Eng., First and Douglas Sts., N. W., Wash. 25, D. C. Bids Mar. 15, awarded Mar. 16. CD 3/19, under LB.

CONTRACTS—BUILDINGS

▲ **General Electric Co.**, 1 River Rd., Schenectady, N. Y. Contract Awarded. **$1,559,000.** furnishing, installing, two 20,000 kw. frequency converters for 74th Street Power Plant, Manhattan Boro, NEW YORK, N. Y. Bd. Transportation, 250 Hudson St., New York 13, N. Y. Bids Dec. 22, awarded Feb. 13. CD 12/4, under Unclassified.

▲ **Turner Constr. Co.**, 420 Lexington Ave., New York, 7, N. Y., Contract Awarded, Approx. **$2,000,000,** part 2 story, bsmnt., part 1 story, 136x574 ft., LABORATORY and SEMI-WORKS bldg. to be known as the Product Development Bldg. 2, near MANVILLE, N. J. Johns-Manville Corp., 22 E. 40 St., New York, 16, N. Y.

▲ **Austin Co.**, 16112 Euclid Ave., Cleveland, O. Contract Awarded. **$4,000,000.** SERVICE PARTS DEPARTMENT Route 6, TETERBORO, N. J. Ford Motor Co., 3000 Schaefer St., Dearborn, Mich.

▲ **DeLuca-Davis Constr. Co., Inc.**, 102 E. 25 St., Baltimore 18, Md. Contract Awarded. **$1,690,000.** 3 story, bsmnt., sub-bsmnt., 86x150 ft., limestone, steel, concrete People's COURT bldg., Fayette and Frederick Sts., BALTIMORE, MD. City, Bureau Bldg. Constr., 410 Municipal Bldg., Baltimore 2, Md. Awarded Mar. 14. CD 1/23, under LB.

▲ **General Refractories**, 1520 Locust St., Phila., Pa. **$2,000,000.** Separate Contracts. altering 1 story. 128x240 ft., refractory PLANT, incl. storage and tunnel, BALTIMORE, MD. A. C. Shape, ch. engr.

▲ **Cramer-Vollmerhausen Co., Inc.**, 260 Connecticut Ave. N.W., Wash., D. C. Contract Awarded. **$1,712,000.** Douglas Junior HIGH SCHOOL, WASH., D. C. Dist. Comrs., District Bldg., Wash., D. C. Awarded Mar. 19. CD 2/15, under LB.

SOUTH

BIDS ASKED—HEAVY CONSTRUCTION

STATE HIGHWAY LETTINGS
BRIDGES
April 10
West Virginia
April 20
Alabama
STREETS AND ROADS
April 10
West Virginia
April 20
Alabama

BIDS ASKED—BUILDINGS

▲ **Fla., Orlando**—SCHOOL—B.A. About 4/15—Orange Co. Bd. P. Instruction, Orlando, North-South Orlando High School. $1,800,000. James Gamble Rogers II, Winter Park, archt. CD 9/8, under LB.

▲† **Tenn., Memphis**—HOUSING—B.A. About 4/15—Dpt. Navy, Millington Air Base, Millington, construct, manage, finance 540 housing unit. $1,000,000. W. C. Lester, Dermon Bldg., archt. CD 9/15.

▲ **La., New Orleans**—PLANT—Bids Asked—Kaiser Engineers, Inc., engr., Box 1501, misc. bldgs. in new aluminum plant zone, $750,000; rein.-con. pile fdns. for various aluminum plant bldgs., $650,000; water lines, $90,000; streets, roads, paving, $100,000, Chalmette, near New Orleans, for Kaiser Aluminum & Chemical Corp., Airline Hy., Baton Rouge. CD 2/21, under CA.

LOW BIDDERS—HEAVY CONSTRUCTION

▲ **A. Stanley Mundy & Co.**, 76 Bolling Rd., Norfolk, Va. Low Bidder, **$2,338,723,** raw water transmission main from Simsonsdale to Lake Prince, NORFOLK, VA. City, City Hall, Norfolk, Va. Bids Mar. 14. CD 3/1.

▲ **State Hy Dpt.**, Jacksonville, Fla., rejected bids Mar. 21, L. B. **$1,179,868** substructure, L. B. **$5,469,177** superstructure, 4,200 ft. double leaf deck truss bascule Gilmore Street Bridge, across St. Johns River, Duval Co. FLORIDA. Will readvertise. CD 2/12.

LOW BIDDERS—BUILDINGS

▲ **E. L. Daniels & Co.**, Arlington, Va. Low Bidder. **$1,600,000.** Washington Lee Senior HIGH SCHOOL, ARLINGTON, VA. Arlington Co., Arlington, Va. Bids Mar. 10. CD 3/6.

▲ **Daniel Constr. Co.**, 429 N. Main St., Greenville, S. C. Low Bidder. **$2,680,000.** low rent HOUSING, S. C.-4-3 GREENVILLE, S. C. Greenville Housing Auth., 432 Perry Ave., Greenville, S. C. Bids Mar. 14. CD 2/12.

▲ **Cooper Agency,** 1218 Washington St., Columbia, S. C. Low Bidder. **$4,194,000.** Construct, manage, finance, HOUSING, 606 two to four apartments for enlisted men and officers, at Shaw Air Base, DA 09-206. Eng. 51-260, SHAW FIELD, S. C. U. S. Eng., South Atlantic lantic Div., Box 1889, Atlanta 1, Ga. CD 12/6.

▲ **Byck-Worrell Constr. Co.**, 318 E. Bay St., Savannah, Ga., Contract warded. **$1,463,847.** Proj. GA-9-3 and GA9-4, HOUSING UNITS, BRUNSWICK, GA. Brunswick Housing Auth., Brunswick, Ga. Bids Feb. 20. CD 3/28, under LB.

▲ **State Div. Admin.**, Baton Rouge, La. rejected bids Feb. 7, acute hospital at Southeast Louisiana State Hospital, MANDEVILLE, LA. L. B. **$1,427,000.** CD 2/13 under LB.

CONTRACTS—HEAVY CONSTRUCTION

▲† **F. H. Martell Co.**, 1023 20 St. N.W., Wash., D. C. Contract Awarded. **$1,061,500,** transmitting station, WOODBRIDGE, VA. U. S. Eng., First and Douglas Sts., Wash., D. C. CD 2/28, under LB.

▲ **A. H. Guion & Co.**, Wilkinson Blvd., Charlotte, N. C. Contract Awarded. **$1,015,280,** Div. 1, Reddy River Sewers; **Peden Constr. Co. Inc.**, 39 Mayberry St., Greenville, S. C., **$357,676,** Div. 2, Brush Creek Sewers*****Glenn Constr. Co.**, Liberty Life Bldg., Charlotte, N. C., **$197,112,** Div. 3, plant imprvs., GREENVILLE, S. C. Greater Greenville Sewer Dist. Comn., c/o Wiedeman & Singleton, engrs., Box 1878, Atlanta, Ga. Grand total $1,570,068. Bids Mar. 15. CD 2/14.

▲ **A. O. Smith Corp.**, Mellie Esperson Bldg., Houston, Tex. Contract Awarded. Total cost **$90,000,000.** Furnishing 240,000 tons steel pipe for natural gas pipe line between Monroe, La. and Michigan City, Ind. with river crossing near Chester, Ill., LOUISIANA, ARKANSAS, MISSOURI, ILLINOIS and INDIANA. Gulf-Michigan Gas Transmission Co., William G. Marbury, pres., 407 N. 8 St., St. Louis 1, Mo.

▲ **R. P. Farnsworth & Co. Inc.**, 1515 S. Salcedo St., New Orleans, La. Contract Awarded. **$4,362,000,** est. $5,000,000. Thomas H. Allen pumping station, 265 ft. wide, MEMPHIS, TENN. Memphis Light Gas & Water Div., 179 Madison Ave., Memphis, Tenn. Bids Mar. 22, awarded Mar. 23. CD 1/25.

CONTRACTS—BUILDINGS

▲ **Vanadium Corp. of America**, 420 Lexington Ave., New York, N. Y. Separate Contracts. **$7,000,000.** silicon alloys PLANT, NEW HAVEN, W. VA. Giffels & Vallet, Marquette Bldg., Detroit, Mich., archts.

▲ **M. B. Kahn Constr. Co.**. Blossom St., Columbia, S. C. Contract Awarded. **$2,522,000.** 300 HOUSING units, COLUMBIA, S. C. Columbia Housing Auth., Gonzales Gardens, Columbia, S. C. Bids Mar. 14. CD 3/20, under LB.

▲ **Algernon Blair Constr. Co.**, First Natl. Bk. Bldg., Montgomery, Ala. Contract Awarded: **$4 000 000,** awarded construction contract 525 unit HOUSING, military personnel at Eglin Air Force Base, EGLIN FIELD, FLA. G. Klosterman, Inc., T. Brooks & W. Dean, Fort Walton, Fa., sponsors. CD 8/30/50, under CA.

▲ **International Minerals & Chemical Co.**, 20 N. Wacker Dr., Chicago, Ill. Owner Builds. **$6 000 000.** chemical processing PLANT expansion, MULBERRY, FLA. CD 11/30.

▲ **United Engineers & Constructors, Inc.**, 1401 Arch St., Phila., Pa. Contract Awarded. **$10 000,000** design and construct calcium carbide PLANT on Tennessee River, CALVERT CITY, KY. National Carbide Co. (Div. Air Reduction Co., Inc.) 60 E. 42 St., New York 17, N. Y.

▲ **Ditmars, Dickman, Pickens Constr. Co.**, Muskogee, Okla. Contract Awarded. **$2,000,000.** 270,000 sq. ft. glass mfg. PLANT, DANVILLE, KY. Corning Glass Works, 718 Works St., New York, N. Y. Awarded Mar. 1.

▲ **Rock City Constr. Co.**, 135 4 Ave. N, Nashville, Tenn. Contract Awarded. **$2 145,000.** LIBRARY and ARCHIVES bldg., NASHVILLE, TENN. State of Tennessee, Nashville, Tenn. Bids Feb. 27. CD 3/8, under LB.

▲† **Carl S. Helrich, Inc.**, Midway M-4 Warehouse, Oak Ridge, Tenn. Contract Awarded. **$1,172.013.** North addn. of PLANT Bldg. 9212 Y-12 area, Inv. No. 401-51-18A, OAK RIDGE, TENN. U. S. Atomic Energy Comn., P. O. Box E, Attention, R. J. Dunbar, Engineering Div., Oak Ridge, Tenn. Bids Mar. 8. CD 2/12.

MIDDLE WEST

BIDS ASKED—HEAVY CONSTRUCTION

STATE HIGHWAY LETTINGS
BRIDGES
April 10
Indiana
Wisconsin
STREETS AND ROADS
April 10
Wisconsin

BIDS ASKED—BUILDINGS

▲ **Ill., Peoria**—HOUSING—B.A. 4/11—Peoria Housing Auth., Peoria, 150-unit housing, Grinnell, Folkers, and Krause, Sts., $1,300,000. Gregg & Briggs, First Natl. Bank Bldg., archts. CD 1/4, under LB.

▲ **Ill., Aurora**—SCHOOL—B.A. 4/16—School Dist. 129, 454 Walnut St., 2 story, steel, concrete, stone Senior High School, $2,000,000. Childs & Smith 20 N. Wacker Dr., Chicago, Zone 1, archts. CD 7/5/40.

Ill., Chicago—PLANT—Bids Asked—Libby McNeil & Libby, Packers and Exchange Ave., Zone 9 Plant "D" addn., modification. $500,000. W. Fred Dolke, 189 W. Madison St., Zone 3, archt.

▲ **Ill., Collinsville** — HOUSING—Bids Asked — Madison County Housing Auth., Collinsville, 100 family multiple dwellings, $1 000,000. Friedman, Alschuler & Sincere, 223 Jackson Blvd., Chicago 6, Ill., archts. CD 2/5/46.

Mich., Flint—SCHOOL—Bids Asked—City, Joseph A. Anderson, secy. Bd. Educ., 2 story, brick, steel Gyles E. Merrill School. $400,000. Eberle M. Smith, 153 E. Elizabeth St., Detroit, archts. CD 2/26.

SOON LETS CONTRACT—BUILDINGS

▲ **Ill., Chicago**—COLD STORAGE—Continental Freezer, Inc., 4240 S. Kildare St., Zone 32, soon lets contract 1 story, mezzanine, 200,000 sq. ft. cold storage bldg. $2,500,000. A. Epstein, 2001 Pershing St., Chicago, 9, Ill., archt.

▲ **Mich., Edmore**—PLANT—Carboloy Co., Inc., 11177 E. 8 Mile Rd., Detroit, soon lets contract, 1 story, carbide metal plant process tungsten carbide, $2,000,000, Smith-Hinchman & Grylls, 800 Marquette Bldg., Detroit, consult. engrs. CD 3/5.

LOW BIDDERS—HEAVY CONSTRUCTION

▲ **Bass Eng. & Constr. Co.,** 215 Birmingham Theater Bldg., Birmingham, Mich., Low Bidder, **$3,388,865,** est. $2,921,000, raw water pumping station and treatment plant***W. B. Gibson Co., Warren, O., **$252,741,** est. $240,000, service bldg. on Laird Ave. ***National Constr. Co., 23500 Lakeland St., and **Utilities Constr. Co. Inc.,** 643 Green St., both of Cleveland, O.; **$1,444,415** est. $1,700,000, force mains, with 420 days for completion; **Curro Constr. Co.,** Union Commerce Bldg., Cleveland, O., **$1,586,889,** force mains with 740 days for completion***Pittsburgh-DesMoines Steel Co., Neville Island, Pittsburgh, Pa., **$192,257,** est. $200,000, million gal. storage tank on Laird Ave., WARREN, O. City, City Hall, Warren, O. Bids Mar. 22. CD 3/16.

LOW BIDDERS—BUILDINGS

▲† **Dawson-Evans Constr. Co.,** 5300 Vine St., St. Bernard, O. Low Bidder, **$1,561,000.** Dorothy Lane Facility WAREHOUSES, DAYTON, O. General Services Admin., Pub. Bldgs. Service, General Services Bldg., 19 and F Sts., N. W. Wash. 25, D. C. Bids Mar. 21. CD 3/7.

▲ **A. Bentley & Sons Co.,** 201 Belmont St., Toledo, O. Low Bidder, Approx. **$2,500,000.** cement MILL addn., 1 story bldg. to enclose kiln, innstall grinding equip. etc. to increase capacity by 500,000 bbl. a year, SILICA, near TOLEDO, O. Medusa Portland Cement Co., Midland Bldg., Cleveland, O.

▲† **Swenson-Carlson Builders,** Cline Ave., East Chicago, Ill., Low Bidder, **$2,245,019,** three 200,000 sq. ft. 1 story concrete block, steel frame WAREHOUSES, HAMMOND, IND. General Services Admin., F St. between 18 and 19 Sts. N. W. Wash., 25 D. C. Bids Mar. 20, CD 3/7.

▲ **Harvey A. Harson,** 1851 Elston Ave., Chicago, 14, Ill. Low Bidder. **$1,175,000.** Hale Grade SCHOOL, 61 and Melvina Sts., CHICAGO, ILL. Bd. Educ., 228 N. LaSalle, Chicago, 1, Ill. CD 2/20/50.

▲ **National Video Corp.,** Grace and Kilbourn Sts., Chicago, Ill., project in abeyance, factory, CHICAGO, ILL. **$1,500,000.** Bids Dec. 15. CD 11/17.

CONTRACTS—HEAVY CONSTRUCTION

▲† **W. L. Johnson Constr. Co.,** Shook Rd., Groveport, O. Contract Awarded, Approx. **$1,250,000,** runway constr., exten. north-south runway from 5,000-9,000 ft. ***James I. Barnes Constr. Co., 6 Bechtle Ave., Springfield, O., rehabilitate certain bldgs. at Lockbourne Air Force Base, COLUMBUS, O. U. S. Eng., Madison Ave. and 8th St. West, Huntington, W. Va.

▲ **S. N. Nielsen Co.,** 3059 Augusta Blvd., Chicago 12, Ill. Contract Awarded. **$4,100,000** filtration works and water softening plant; **Bass Eng. & Constr. Co.,** 215 Birmingham Theatre Bldg., Birmingham, Mich., **$738,800,** filter equipment, DAYTON, O. City, City Hall, Dayton, O. Bids Feb. 28, awarded March 14. CD 3/7, under LB.

▲ **John J. Tully Constr. Co.** 33 N. La Salle St., Chicago, 2, Ill., Contract Awarded. **$1,600,415,** main drain for Congress Superhighway from Sacramento Blvd. to Ashland Ave., CHICAGO, ILL. City, City Hall, Chicago 2, Ill. Bids Feb. 8, awarded Feb. 16. CD 2/30, under LB.

CONTRACTS—BUILDINGS

▲ **J. L. Simmons Co.,** Inland Bldg., Indianapolis, Ind. Contract Awarded, **$3,500,000,** 5 story, concrete, face brick, stone FOOD SERVICE BLDG., INDIANAPOLIS, IND. medical center, University of Indiana, Union Bldg., Bloomington, Ind. Awarded Mar. 14. CD 12/1.

▲ **Gust K. Newberg Co.,** 2040 N. Ashland St., Chicago 13, Ill. Contract Awarded. Total est. **$30,000,000.** substructure only for POWER PLANT, near TERRE HAUTE, IND. Public Service Co. of Indiana, Traction Bldg., Indianapolis, Ind. CD 8/22/47.

▲ **Ragnar Benson, Inc.,** 4744 W. Rice St., Chicago, 51, Ill. Contract Awarded. Total Approx. **$17,000,000.** MAIN BLDG.***Darin & Armstrong, 2041 Fenkel Ave., Detroit, Mich., machinery foundation ***W. E. O'Neil Constr. Co., 2751 Clybourn St., Chicago, 14, Ill., FORGE PLANT***Sherman-Olson Co., 600 W. Jackson St., Chicago, 6, Ill., FOUNDRY BLDG.—rehabilitation of aircraft engine bldg., CHICAGO, ILL. Ford Motor Co., 7401 S. Cicero St., Chicago 29, Ill. CD 2/27.

▲ **Campbell Lowrie & Lautermilch,** 400 W. Madison St., Chicago, 6, Ill. Contract Awarded. **$4,000,000.** 3 story, 380,000 sq. ft. FACTORY, CHICAGO, ILL. Zenith Radio Corp., 4434 LeMoyne St., Chicago, 30, Ill. Awarded Mar. 14. CD 12/28.

▲ **James Stewart Corp.,** 231 S. LaSalle St., Chicago, 1, Ill. Contract Awarded. **$3,000,000.** GRAIN ELEVATORS, DECATUR, ILL. A. E. Staley Mfg. Co., Decatur, Ill. Awarded Mar. 15. CD 3/13.

▲ **Sullivan Constr. Co.,** 400 W. Madison St., Chicago, 6, Ill. Contract Awarded. approx **$1,800,000,** 184 RESIDENCES, FRANKLIN PARK, ILL. Reuter Home Builders, Inc., 7177 W. Grand St., Chicago, 35, Ill. Awarded Mar. 7. CD 4/21.

▲ **The Austin Co.,** 510 N. Dearborn St., Chicago, 10, Ill. Contract Awarded, **$2,000,000** design and construct, steel, concrete, brick, 300x560 ft. parts WAREHOUSE and 50x500 ft. OFFICE, MELROSE PARK, ILL. Ford Motor Co., North Ave. at 25 St., Melrose Park, Ill. Awarded Mar. 7.

▲ **Ragnar Benson, Inc.,** 4744 W. Rice St., Chicago, 51, Ill. Contract Awarded. **$1,324,809,** LABORATORY, MELROSE PARK, ILL. International Harvester Co., North and Lagrange Rds., Melrose Park, Ill. Awarded Mar. 15.

▲ **J. W. Snyder Co.,** 307 N. Michigan St., Chicago, 1, Ill. Contract Awarded. **$1,395,000,** HOSPITAL addn. and modification, OAK PARK, ILL. Sisters of Misericorde Hospital, Monroe and Wisconsin Sts., Oak Park, Ill. Bids Sept. 26. CD 9/6.

▲ **Manitowoc Portland Cement Co.,** Manitowoc. Separate Contracts. **$2,500,000,** 340 ft. long kiln, 300 ft. concrete stack, piles cement PLANT addns., MANITOWOC, WIS. CD 3/14.

▲ **Klug & Smith Co.,** 4425 W. Mitchell St., Zone 14, Wis. Contract Awarded. **$2,000,000,** 93x480 ft., rein.-con. GRAIN ELEVATOR and six 110x200 ft. metal buildings, MILWAUKEE, Wis. Jos. Schlitz Brewing Co., 235 W. Galena St., Milwaukee 21, Wis. BD 1/16.

▲ **J. A. Utley Co.,** 723 E. 10 Mile Rd., Royal Oak, Mich. Contract Awarded. **$5,800,000.** 1 story, 580,000 sq. ft. jet engine MANUFACTURING BLDG., FLINT, MICH. Buick Motor Div. General Motors, Flint 2, Mich. Awarded Mar. 22.

WEST OF MISSISSIPPI

BIDS ASKED—HEAVY CONSTRUCTION

STATE HIGHWAY LETTINGS

BRIDGES

April 13
Kansas

April 17
Texas

April 18
Kansas

STREETS AND ROADS

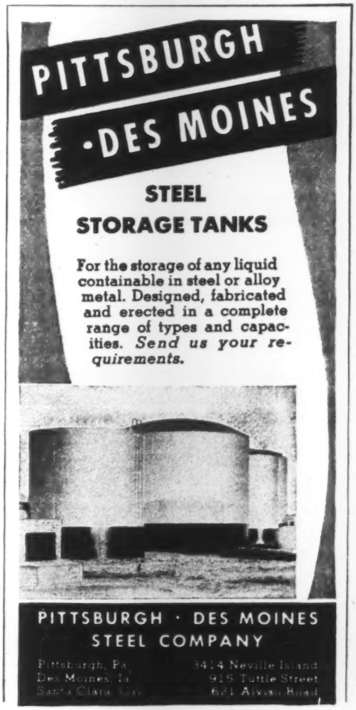
April 13
Kansas

April 17
Texas

April 18
Kansas
Texas

North Dakota — RURAL DISTRIBUTION LINES — B.A. About 4/15—West Plains Electric Co-operative, Dickinson, 505 mi. rural distr. lines and service to new sub-station, $725,000. Ulteig Eng. Corp., 1114½ Front St., Fargo, N. D., engr. CD 6/29.

▲† **Oklahoma**—B.A. 4/15—U. S. Eng., Box 61, Tulsa, Okla., electric power house and equip. Installation on Tenkiller Ferry Dam on Illinois River, 7 mi. north of Gore, Sequoyah Co. $2,225,000. Plans deposit $50.



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Des Moines, Ia. 915 Tuttle Street
Santa Clara, Cal. 621 Alviso Road

BIDS ASKED—BUILDINGS

▲ **Minn., St. Paul**—HOUSING—B.A. 4/11—St. Paul Housing & Redevelopment Auth., 1745 City Hall and Court House, one hundred and four bldgs., 418 dwelling units, etc. Orro Bremer Homes, between Old Hudson Rd. and E. 3 St., $4,000,000. Extended date. Associated Architects & Engineers, 416 Endicott Bldg., St. Paul, archts. and engrs. CD 3/7.

▲ **Tex., Houston**—PLANTS—Bids Asked—Sheffield Steel Corp., Industrial Rd., steel ingot and plate mill, $12,250,000; seamless tubing mill, $20,000,000; blast furnace, $12,500,000; open hearth furnace, $10,275,000; misc. constr. in steel mill area, $2,000,000; blooming mill, $16,500,000. W. C. Higdon, c/o owner, engr. CD 2/13.

▲ **Tex., Hughes Springs**—GENERATING PLANT—Bids Asked—Southwestern Gas & Electric Co., Longview, 40,000 kw. generating plant, $2,250,000. CD 11/14/49, under Tex., Longview.

▲ **Tex., Port Arthur**—CHEMICAL PLANT—Bids Asked—Koppers Co. Inc., Koppers Bldg., Pittsburgh, Pa., chemical plant. $12,000,000. CD 2/13.

▲ **Tex., Rusk**—MINING PLANT—Bids Asked—Armco Steel Corp., Rusk, Tex., iron ore mining plant. $1,500,000. CD 2/14.

LOW BIDDERS—HEAVY CONSTRUCTION

▲† **J. A. Johnson Co.,** 1412 S 5 St., and **Winston Bros. Co.,** 1470 N. W. Bank Bldg., both Minneapolis, Minn. Low Bidders. **$7,952,362,** spillway Stage 1, for Fort Randall Reservoir, near Lake Andes, Inv. 85, SOUTH DAKOTA. U. S. Eng., 1709 Jackson St., Omaha, Neb. Bids Mar. 23. CD 2/15.

▲† **Russ Mitchell, Inc. and Bruce Constr. Co.,** 5304 Old Spanish Trail, Houston, Tex. Low Bidder. **$2,198,313.** power house, switchyards and other facilities at $42,000,000 Whitney Dam and Reservoir Project in Central Tex., CIVENG 41-443-51-33, TEXAS. U. S. Eng., 1127 Texas and Pacific Bldg., Fort Worth, Tex. Bids Mar. 15. CD 1/18.

▲† **U. S. Eng.,** 606 Santa Fe Bldg., Galveston, Tex., cancelled bids to have been opened Mar. 28, 30 standard type barracks, 2 story partial bsmnt., wood frame, **$3,750,000;** three 500 man each mess halls, 94x150 ft. wood frame, **$785,000** Inv. No. Eng. 41-243-51-0, LACKLAND AIR BASE (Br. San Antonio), TEXAS. Will re-advertise. CD 3/9.

▲† **U. S. Eng.,** 606 Santa Fe Bldg., Galveston, Tex., cancelled bids to have been opened Mar. 27, 104 standard type dormitories, 2 story wood frame, concrete slab fdn., concrete partial bsmnt., **$11,000,000;** eleven 500-man mess halls, **$3,850,000,** Inv. No. Eng. 41-243-51-48, at LACKLAND AIR BASE (Br. San Antonio), TEX. Will re-advertise. CD 3/9.

▲† **U. S. Eng.,** 606 Santa Fe Bldg., Galveston, Tex., cancelled bids, 16 BARRACKS, LACKLAND AIR BASE (Br. San Antonio), TEX. **$2,000,000.** Will re-advertise. CD 2/7.

▲† **Bureau Reclamation,** Great Falls, Mont., Tiber Dam across Marias River, MONTANA. Low bidder withdrew bid because time of acceptance had expired, L.B. **$11,504,562.** Will not be re-advertised because of economy program. CD 8/22, under LB.

▲† **Winston Bros. Co.,** Monrovia, Calif. Low Bidder. **$2,240,359,** est. $2,666,582. constr. Flation power and pumping plant and afterbay dam, Estes Park-Foothills power aqueduct, Colorado-Big Thompson Proj., Spec. DC-3306, COLORADO. Bureau Reclamation, Dpt. Interior, Loveland, Colo. Bids Mar. 15. CD 3/5.

LOW BIDDERS—BUILDINGS

▲ **A. J. Rife Constr. Co.,** 2608 Inwood Rd., Dallas, Tex. Low Bidder, **$2,536,980,** est. $2,500,000, Bid 1, brick veneer; **Busboom & Rauh,** 6910 Forest Park Rd., Dallas, Tex. **$2,606,776,** Bid 2, masonry wall, wood framing and second floor for 300 DWELLING units in 50 bldgs., Tex. 9-6, DALLAS, TEX., Dallas Housing Auth., 2525 Lucas Dr., Dallas Tex. Bids Mar. 20. CD 3/9.

▲ **E. I. duPont de Nemours & Co.,** Orange, Tex., cancelled bids chemical (polythene) PLANT expansion, ORANGE, TEX. **$4,500,000.** Will re-advertise. CD 1/5.

CONTRACTS—HEAVY CONSTRUCTION

▲† **Guy H. James Constr. Co.,** 1st Natl. Bldg., Oklahoma City, Okla. Contract Awarded. **$2,787,664,** substructure; **American Bridge Co.,** 629 S. E. 2 St., Minneapolis, Minn., **$2,817,611,** superstructure, for Omaha Railroad Bridge over Missouri River. Fort Randall Dam Project, Inv. 71, near Chamberlain, SOUTH DAKOTA. U. S. Eng., 1709 Jackson St., Omaha, Neb. Bids Feb. 14. CD 2/20, under LB.

▲† **Farnsworth & Chambers Co., Inc.,** Box 74, Houston, Tex. Contract Awarded. **$2,245,000,** est. $3,513,000. 12 two story wood frame, part bsmnt. barracks, Inv. No. Eng 41-243-51-44, RANDOLPH FIELD (near San Antonio) TEX. U. S. Eng. 606 Santa Fe Bldg., Galveston, Tex. Bids March 24. CD 3/9.

CONTRACTS—BUILDINGS

▲ **Central Power Electric Co-operative,** Minot, N. D. Separate Contracts. Approx. **$8,521,000.** 45,000 kw. STEAM GENERATING PLANT, VOLTAIRE, N. D. Ulteig Engr. Corp., 1114½ Front St., Fargo, N. D. engr. Vern E. Alden Co., 120 S. LaSalle St., Chicago, Ill., archts. CD 1/9, under N. D., Carrington.

▲ **Omaha Public Power Dist.,** 17 and Harney Sts., Omaha, Neb. Owner Builds. **$1,700,000.** power unit completion with bldg. alterations and main power plant, 4 and Jones Sts.; **$382,000.**, exten.; imprv. 66 kv. distr. sys.; **$1,787,000**, power cable lines and other construction for service, OMAHA, NEB. CD 2/26.

▲ **Winn-Senter-Rau Constr. Co.**, Railway Exchange Bldg., Kansas City 6, Mo. Own Forces. **$10,000,000.** 800 HOME development incl. streets, sewerage sys., south side of U. S. Hy. 40 6 mi. west of Kansas City, Bel Crest, KANSAS CITY, KAN.

▲ **Cooper-Bessemer Corp.**, 200 Thomas Ave., Mt. Vernon, O. Contract Awarded. **$12,000,000.** 40 GAS ENGINES for aluminum reduction plant, GREGORY, TEX. Reynolds Metal Co., Hunt Bldg., Gregory, Tex. CD 2/20.

▲ **Houston Lighting & Power Co.**, 1016 Walker St., Houston, Tex., Purchase and Hire. **$5,575,000.** generating units (where needed) totalling 60,000 watt; **$685,000**, enlarging, imprvs. sub-station, HOUSTON, TEX. CD 3/24/47.

▲† **Austin Co.**, 16112 Euclid Ave., Cleveland, O. Contract Awarded. **$45,000,000.** Rocky Flats Atomic Energy radiological Research PLANT, near BOULDER, COLO. U. S. Atomic Energy Comn., 109 E. Place Ave., Santa Fe, N. M. To be operated by Dow Chemical Co., Midland, Mich.

FAR WEST

BIDS ASKED—HEAVY CONSTRUCTION

STATE HIGHWAY LETTINGS
STREETS AND ROADS

April 15	April 18
California	California

▲ **Calif., San Diego**—B.A. 4/19—San Diego Flood Control Dist., Civic Center Bldg., 1021 ft. Moreno Blvd. Bridge, 48 ft. roadway. $1,000,000. Plans deposit $50. Donald R. Warren, 500 S. Figueroa St., Los Angeles, Calif., engr.

BIDS ASKED—BUILDINGS

▲ **Calif., San Francisco**—SCHOOL—B.A. 4/18—Dpt. P. Wks., City Hall, Abraham Lincoln High School, addns., alterations. $2,889,000. Weihe, Frick & Kruse, 251 Kearny St., archts. CD 2/15.

LOW BIDDERS—BUILDINGS

▲ **Del E. Webb Constr. Co.**, 302 S. 23 Ave., Phoenix, Ariz. Low Bidder. **$$4,813,500.** 400-bed 5 story HOSPITAL, PHOENIX, ARIZ. Sisters of Mercy, St. Joseph's Hospital, Phoenix, Ariz. Lescher & Mahoney, Title & Trust Bldg., Phoenix, Ariz., archts.

CONTRACTS—HEAVY CONSTRUCTION

▲ **Morrison-Knudsen Co., Inc.**, 319 Broadway, Boise, Idaho. Contract Awarded. **$26,000,000.** dam 305 ft. above bed rock and hydro-electric plant to produce 100,000 kw. initially, Woodland, WASHINGTON. Pacific Power & Light Co., 9200 S. W. 6 St., Portland, Ore. CD 1/30.

▲ **Guy F. Atkinson Co.**, Box 259, Long Beach, Calif. Contract Awarded, **$3,389,650**, existing bridge alterations, construct 3 new bridges approaches on Colorado Freeway, Pasadena, Los Angeles Co., CALIFORNIA. State Div. Hys., Sacramento, Calif. Bids Mar. 8, awarded Mar. 16. CD 3/14, under LB.

▲† **Peter Kiewit Sons' Co.**, 345 Kieways, Arcadia, Calif. Contract Awarded, **$2,360,187**, imprv. Los Angeles River, Los Angeles County Drainage area, etc., Stewart and Gray Rd. to Imperial Hy., South Gate, Los Angeles Co., CIVENG 04-353-15-13, CALIFORNIA. U. S. Eng., 751 S. Figueroa St., Los Angeles, Calif. Bids Feb. 20, awarded Mar. 16. CD 2/28, under LB.

▲† **A. Teichert & Son**, Box 436, North Hollywood, Calif. Contract Awarded. **$1,867,539**, est. $2,000,000. Los Angeles River Imprvt., Fulton Ave. to Van Nuys Blvd., CIVENG No. 04-353-51-49, CALIFORNIA. U. S. Eng., 751 S. Figueroa St., Los Angeles, Calif. Bids Feb. 27, awarded Mar. 15. CD 3/5, under LB.

▲† **Barrett & Hilp**, 918 Harrison St., San Francisco, Calif., Contract Awarded. **$4,000.000.** military housing at Castle Air Force Base, MERCED, CALIF. U. S. Eng., 180 New Montgomery St., San Francisco, Calif. Awarded Mar. 22.

CONTRACTS—BUILDINGS

▲† **Moore & Roberts, Inc.**, 693 Mission St. and **B. & R. Constr. Co.**, 110 Market St., San Francisco, Calif. Contract Awarded. **$4,250,000**, est. $3,443,000. 11 BUILDINGS, incl. fire station, bachelor quarters, barracks and mess, service club, civilian male dormitory and civilian female dormitory, in Area "E" Dugway Proving Grounds, TOOELE, UTAH. U. S. Eng., 74 New Montgomery St., San Francisco, Calif. Bids Mar. 8.

▲† **Jacobson Constr. Co.**, 724 S. 3rd East St., Salt Lake City, Utah. Contract Awarded. **$2,544,000, est.** $2,204,841. 11 army BUILDINGS in Area B, Dugway Proving Ground, TOOELE, UTAH. U. S. Eng., 74 New Montgomery St., San Francisco, Calif. Awarded Mar. 15.

▲ **Guy F. Atkinson Co. & Assocs.**, 10 W. Orange Ave., South San Francisco, Calif. Contract Awarded. **$14,688,030**, Ross POWERHOUSE, SEATTLE, WASH. City, County-City Bldg., Seattle, Wash. Bids Mar. 7, awarded Mar. 14. CD 3/13, under LB.

▲† **H. B. Nicholson**, 117 E. Colorado St., Pasadena, Calif; **Jas. L. Ferry, N. P. Van Valkenburgh Co.**, 8609 San Vincente St., Inglewood, Calif. Contract Awarded. **$2,896,000.** 210-FAMILY UNITS INYOKERN, CALIF. Yard & Docks Annex, Navy Dpt., Inyokern, Calif. Bids Mar. 6, awarded Mar. 23. CD 3/15, under LB.

ALASKA

BIDS ASKED—HEAVY CONSTRUCTION

▲† **Alaska, Fort Richardson**—INDOOR TRAINING FACILITY BLDG.—B.A. 4/17—U. S. Eng., New Washington Hotel, Seattle 1, Wash., indoor training facility bldg., Inv. No. S95-507-51-80. $2,600,000. Plans deposit $100. P. Belluschi, 2040 S.W. Jefferson St., Portland, Ore., archt. CD 3/14.

CONTRACTS—HEAVY CONSTRUCTION

▲† **Manson Constr. & Eng. Co.**, 821 Alaskan Way, and **Osberg Constr. Co.**, 1132 N. 128 St., both Seattle, Wash., and **Halvorson Contractors**, Ziegler Bldg., Spokane, Wash. Contract Awarded. **$1,936,629.** clearing, grubbing, grading, drainage and bridges 16.52 mi Seward-Anchorage Hy., Sect. A2, B3, Units 1 and 2, Mile 12.1 to 14.8, 18.1 to 33, ALASKA, Bureau Pub. Roads, Juneau, Alaska. Bids Mar. 6. CD 3/12, under LB.

▲† **Morrison-Knudsen Co., Inc.**, 319 Broadway, Boise, Idaho, and **Peter Kiewit Sons Co.**, 1300 Aloha St., Seattle, Wash. Contract Awarded. **$5,053,970.** military installation, St. Lawrence Island, incl. housing, utilities, technical facilities, ALASKA. U. S. Eng. (APO 942, c/o PM, Seattle, Wash.), Anchorage, Alaska.

CANADA

BIDS ASKED—HEAVY CONSTRUCTION

P. E. I., Summerside—SUPPLY BLDG., etc.—B.A. 4/10—P. J. Mangan, engr. Defence Constr. Ltd., 1032 Gottingen St., Halifax, N. S., one supply bldg. and one construction engineering bldg. at R.C.A.F. Station. Approx. $500,000. Plans deposit $50.

BIDS ASKED—BUILDINGS

Que., Richmond—HOME—B.A. 4/9—McDougall, Smith & Fleming, 1235 McGill College Ave., Montreal, Que., 3 story, bsmnt., structural steel, brick, block Old Peoples Home addn., near here, for Wales Home for Protestant Old People, Dr. E. C. Manning, secy., Richmond, Que. Approx $600,000. McDougall & Friedman, 1235 McGill College Ave., Montreal, Que., engrs. CD 8/12/49.

▲ **Alta., Penhold** — BUILDINGS — B.A. 4/10 — R. F. Hurst, engr. Defence Constr. Ltd., 400 Kensington Bldg., Winnipeg, Man., 12 bldgs. at R. C. A. F. Station. Approx. $1,100,000. Plans deposit $100.

LOW BIDDERS—HEAVY CONSTRUCTION

▲ **British Columbia Bridge & Dridging Co. Ltd.**, 544 Howe St., and **Dawson, Wade & Co. Ltd.**, 775 Clark St., both Vancouver, B. C., Low Bidder. **$6,254 376**, Granville St. Bridge about 1,773 ft. long between centers of piers, about 103 ft. wide, etc., VANCOUVER, B. C. City, City Hall, Vancouver, B. C. Bids Mar. 19. CD 2/26.

CONTRACTS—BUILDINGS

▲ **Dickie Constr. Co. Ltd.**, 17 Yorkville Ave., Toronto, Ont. Contract Awarded, **$3,000,000**, 293-bed, 5 story three wings T-shaped, plus 6 story unfinished rein.-con., brick, HOSPITAL, ST. THOMAS, ONT. St. Thomas Elgin Hospital Bd., St. Thomas, Ont. Govan, Ferguson, Lindsay, Kammiker, Maw, Langley & Keenleyside, 515 Janis St., Toronto, Ont., archts. Bids Jan. 24. CD 12/27.

U. S. POSSESSIONS

LOW BIDDERS—HEAVY CONSTRUCTION

▲ **Zequeira & Pinero, Inc.**, Hato Rey, Puerto Rico. Low Bidder. **$1,298,600**, constructing second phase of Isla Verde International Airport, incl. constructing runway 7,800 ft. long, 150 ft. wide, plus a taxiway 50 ft. wide, all of rein.-con. 11 in., incl. installing electric conduits, underground job and stabilizing and compacting of sub-grade, PUERTO RICO. Puerto Rico Transportation Auth., San Juan, Puerto Rico. Bids Mar. 8. CD 2/15.

LATIN AMERICA

LOW BIDDERS—HEAVY CONSTRUCTION

▲ **Construciones Hidraulicas, S. A.**, Ing. Miquel Jinich, mgr. Ejido, 43-404, Mexico City, Mexico. Low Bidder, **$9,262,535.** Earthwork and structure of Canal Alto, Yaqui River Irrigation Dist., Soronra State, MEXICO. Secretariat of Hydraulic Resources, Paseo de la Reforma Number 69, Mexico City, Mexico (Dpt. Contracts for Irrigation Works and River Control). Bids Mar. 12. CD 2/9.

CONTRACTS—HEAVY CONSTRUCTION

▲ **Utah Constr. Co.**, 57 E. 4th St. South, Salt Lake City, Utah, U. S. A. Contract Awarded. Approx. **$2,300,000.** construction and maintenance of roads, COLOMBIA. Minister of Pub. Wks., Bogota, Colombia. CD 6/13/46.

AMERICANS ABROAD

CONTRACTS—BUILDINGS

Kellogg International Corp., 225 Broadway, **New York**, N. Y., U. S. A., design and construct, gasoline-from-coal synthesis PLANT, COALBROOK, SOUTH AFRICA.

OFFICIAL PROPOSALS

Bids: May 7, 1951

Additions to Elementary Schools

BOARD OF EDUCATION
TOWNSHIP OF TEANECK, NEW JERSEY

Separate sealed proposals will be received for the construction of additions to the John Greenleaf Whittier and the Nathaniel Green Hawthorne elementary schools, Teaneck, N. J., by the Board of Education, until 8 o'clock P.M., May 7, 1951, at the Board Room in the High School, Elizabeth Avenue, Teaneck, N. J., and then publicly opened and read aloud.

Proposals will be received for the following branches of the work:

(A) General Construction
(B) Steel and Iron
(C) Heating and Ventilating
(D) Plumbing
(E) Electric

Plans and specifications can be obtained at the office of the Architect, George Maxwell Cady, 210 The Plaza, Teaneck, N. J., upon presentation of a certified check, in the sum of fifty ($50.00) dollars, payable to the Architect, and refundable if a bid is submitted, upon the return of the plans and specifications in good condition.

Each bid must be accompanied by a certified check, payable to the Board of Education, Teaneck, N. J., duly executed in the sum of not less than five (5%) percent of the amount of the base bid. Such security will be returned within five (5) days after the formal opening of bids to all except the three lowest bidders for each branch of the work, and the remaining will be returned after the Board of Education has executed contracts with the bidders whose proposal has been accepted.

The Board of Education reserves the right to reject any and all bids or to make such awards as may be in its best interest.

JOHN H. RANGES
District Clerk of the Board of Education
Teaneck, N. J.

March 26, 1951

Bids: April 26, 1951

Steel Sheet Piling—Tie Rods Channel Iron

MARYSVILLE, MICHIGAN

Sealed bids on approximately 700 lineal feet of steel sheet piling of various lengths and approximately 4000 lineal feet of tie rods and channel iron, as per specifications, will be received by the City Clerk, City of Marysville, until 3:00 P.M., E.S.T., April 26, 1951, at which time they will be publicly opened and read.

Specifications may be obtained at the City Manager's office, City Hall, Marysville, Michigan.

The City Commission reserves the right to accept or reject any or all bids, as it may deem best.

Mildred Falardeau
City Clerk

Bids: April 19, 1951

Renovation in the Northwest Quarter of the 4th Floor Port Authority Building

THE PORT OF NEW YORK AUTHORITY
CONTRACT O & M—125

Sealed proposals for Renovation in the Northwest Quarter of the 4th Floor of the Port Authority Building, 111 Eighth Ave., New York, will be received in the office of the Director of Purchase of The Port of New York Authority, Room 1402, 111 Eighth Ave., New York, until 11 A. M. Thursday, April 19, 1951, at which time and place said proposals will be publicly opened and read.

Contract documents may be obtained from the Department of Purchase.

THE PORT OF NEW YORK AUTHORITY
Howard S. Cullman, Chairman.
New York, April 5, 1951

U. S. Government

BIDS FOR REPLATING STEEL BARGES—Memphis District, Corps of Engineers, U. S. Army, P. O. Box 97, Memphis 1, Tenn. Sealed bids will be received until 11:00 a.m., C.S.T., 17 April 1951, and then publicly opened for replating twenty steel material barges. Information upon request.

(Continued on page 71)

U. S. Government

(Continued from page 70)

UNITED STATES DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids. (**Specifications No.** DC-3368) will be received by **Bureau of Reclamation**, Ephrata, Washington, **until April 26, 1951**, and then publicly **opened for furnishing** labor and materials **and performing all work** for the construction of machine shop building for O and M headquarters at Othello, Washington. **The work is situated in the town of Othello, Washington. Principal items are approximately**: 530 c. y. **excavation; 410 c.** y. concrete; constructing **machine shop; and other work.** Time allowed for completion will be 225 days. For particulars, address Bureau of Reclamation, Ephrata, Washington; or Building 1-A, Denver Federal Center, Denver, Colorado.

Department of Commerce, Bureau of Public Roads, March 22, 1951. SEALED BIDS will be received at the office of the Division Engineer, Bureau of Public Roads, **1440 Columbia Pike, Arlington, Virginia, until 11:00 a.m.,** E.S.T., **April 20, 1951 for Project 3A6B6,** Shenandoah National Park. **From Swift Run Gap to Big Flat Mountain. Greene,** Rockingham **and** Albemarle **Counties, Virginia.** 29,300 tons **Type H-1 Asphalt Pavement, Liquefier Type, and other work.** Length 14.954 miles. Minimum **wage rates have been fixed** as required **by law. For plans and** specifications, **a deposit of $10.00** cash or CERTIFIED check made payable to the Treasurer of the United States, will be required to insure their return within 15 days after the opening of Bids. Plans, specifications, and proposal forms may be obtained at the address given above, or at Bureau of Public Roads, 920 South Jefferson Street, Roanoke, **Virginia. H. J. Spelman, Division Engineer.**

OFFICIAL PROPOSALS

Bids: April 23, 1951

Sewage Treatment Plant and Intercepting Sewer Project

CITY OF LONG BEACH, N. Y.

1. Sealed Proposals for the construction of the herein described Contracts for a Sewage Treatment and Intercepting Sewer Project in the City of Long Beach, New York, will be received by the City Manager until 2:30 o'clock P. M., E.S.T. April 23, 1951, in his office in City Hall, Long Beach, New York, and there publicly opened and read immediately thereafter.

2. The work will consist of providing all labor, materials, equipment and incidentals required for the construction of the following:

CONTRACT 1A—GENERAL CONSTRUCTION; SEWAGE TREATMENT PLANT—SECOND STAGE
(High-Rate Filters, Final Clarifiers; Recirculation Station; Vacuum Filter Installation; Outlet Pipe; Miscellaneous Piping, Building Superstructures and all Equipment Items.)

CONTRACT 11A—HEATING AND VENTILATING WORK required for Sewage Treatment Plant—Second Stage.

CONTRACT 111A—PLUMBING WORK required for Sewage Treatment Plant—Second Stage.

CONTRACT 1VA—ELECTRICAL WORK required for Sewage Treatment Plant—Second Stage.

CONTRACT A—INTERCEPTING SEWERS—(Approximately: 100 L.F.-12" R.C. Pipe; 850 L.F.-18" R.C. Pipe; 800 L.F.-24" R.C. Pipe; 3100 L.F.-30" R.C. Pipe; 1700 L.F.-33" R.C. Pipe; 1150 L.F.-42" R.C. Pipe; 250 L.F.-48" R.C. Pipe and appurtenant structures).

3. Plans, Specifications, bidding and contract documents may be examined at the office of the Consulting Engineers, Alexander Potter Associates, 50 Church St., New York 7, N. Y., and at the Office of the City Engineer at City Hall, Long Beach, N. Y. and obtained from the latter upon the following deposits per set:

CONTRACT 1A—Sewage Treatment Plant—Second Stage General Construction	$40.00
CONTRACT 11A—Heating and Ventilating Work	$15.00
CONTRACT 111A—Plumbing Work	$15.00
CONTRACT 1VA—Electrical Work	$20.00
CONTRACT A—Intercepting Sewers	$20.00

Full refund will be made to actual bidders for return of one (1) set, in good condition, within two weeks after closing date for receipt of bids; refund for return of all other sets, in good condition, within the same period, will be fifty percent (50%) of the deposit.

4. All proposals must be on the form contained in the specifications as furnished by the City.

5. All bids must be accompanied by a Certified Check or Acceptable Bidder's Bond in the amount of Ten (10%) percent of the amount of the Bid, made payable to the City Treasurer, City of Long Beach. Said checks will be returned to all, except the three (3) lowest bidders not later than ten (10) days after opening of bids.

6. The successful bidder in each of the several contracts will be required to furnish a Performance Bond conditioned upon the faithful performance of the contract and upon the payment of all persons supplying labor and furnishing materials on the construction of the work.

7. No bidder may withdraw his bid **within thirty (30) days after closing date for receipt of bids.**

8. The bidder's attention is directed to the provision whereby each bidder may submit separate and/or combined bids for contracts 1A and A.

9. The City Council reserves the right to reject any or all bids and to waive any informality in the Bid, and to accept that proposal which in its judgment best serves **the interests of the City.**

CITY OF LONG BEACH, N. Y.
By: MAURICE J. FLEISCHMAN
CITY MANAGER

Dated: April 3, 1951

Bids: May 8, 1951

Freud Storm Water Pumping Station Caisson

DEPARTMENT OF PUBLIC WORKS
CITY OF DETROIT, MICHIGAN
CONTRACT PW-1071B1

Sealed proposals for the caisson for Freud Storm Water Pumping Station, located at Freud Avenue and Clairpointe Avenue, addressed to the Department of Public Works of the City of Detroit and endorsed "Proposal for Contract PW-1071B1" will be received at the office of the Department of Public Works, 104 City Hall, until 2:00 p.m., City of **Detroit Time,** on Tuesday, May 8, 1951, at which time they will be publicly opened and read aloud. Any proposal received after the above-mentioned time will be **returned to the bidder** unopened.

The work included consists of the construction of the concrete caisson portion of the pumping station. Other parts of the pumping station will be done by separate contracts let at later dates. The caisson will have an outside diameter of 112 feet with walls 6 feet thick. The caisson **is to** be sunk into place approximately **88.0 feet.** Also included are concrete supporting **walls** inside the caisson for the future **wet well** floor.

The Contract Documents, including Notice to Bidders, Form of Proposal and Agreement, Drawings, and Specifications may be examined at the office of the City Engineer, 30th Floor Guardian Building, Detroit 26, Michigan, during business hours and copies may be obtained by making a deposit of $10 per set, which sum will be refunded upon the return in good condition of the complete set of Contract Documents within 10 days after receipt of proposals, or if used in submitting a bona fide proposal.

Each proposal shall be accompanied by a certified check or a satisfactory bidder's bond in an amount not less than 5 percent of the total bid price as security for the acceptance of the Contract.

After the scheduled closing time for receipt of bids, no proposal may be withdrawn for at least 45 days.

The City of Detroit reserves the right to **waive** any **informality** in any bid, or to accept any bid, or to reject any or all bids, should it be deemed for its best interests so to do.

CITY OF DETROIT
CARL D. WARNER, Commissioner
Department of Public Works
G. R. THOMPSON
City Engineer

Bids: April 27, 1951

Administration Building

SEALED PROPOSALS will be received by the Allentown Hospital, 17th & Chew Sts., Allentown, Penna., up to 5 P.M. (S.T.) April 27, 1951 for the following projects to be performed on plot located at 17th and Chew Sts., Allentown, Pa.

1—General Construction: **Adminis. Building.**
2—Heating Work " "
3—Plumbing Work " "
4—Electrical Work " "
5—Wrecking: Present Buildings on Grounds

Plans and Specifications not exceeding 2 sets, may be obtained at the office of the Architects, Robert Lange & James M. Everett, 12 N. 6th St., Allentown, Penna., upon receipt of a check or cash as follows:

1—General Work	$30.00,	extra	set	$20.00
2—Heating Work	20.00	"	"	10.00
3—Plumbing Work	20.00	"	"	10.00
4—Electrical Work	20.00	"	"	10.00
5—Wrecking	2.00			

Bids: April 27, 1951

Roadway Lighting

DELAWARE RIVER
JOINT TOLL BRIDGE COMMISSION
526 Broad Street Bank Building
Trenton 8, New Jersey

Sealed proposals for the installation of the Roadway Lighting for the Delaware River Bridge and Approaches between Morrisville, Pennsylvania and Trenton, New Jersey will be received by the Delaware River Joint Toll Bridge Commission at its Office, 526 Broad Street Bank Building, Trenton 8, New Jersey, until eleven o'clock (11:00) A.M., Eastern Standard Time, on the 27th day of April, 1951, at which time and place all bids will be publicly opened and read aloud.

After Monday, April 2, 1951, Instructions to Bidders, form of Proposal, form of Contract, form of Performance Bond, Plans and Specifications may be examined at the office of the Commission, above address, or at the office of the J. E. Greiner Company, 1201 St. Paul Street, Baltimore 2, Maryland, and copies thereof obtained upon payment of a $5.00 deposit for each set. This deposit will be refunded upon the return of the documents in usable condition within 30 days after receipt of bids.

The work includes furnishing and installing the roadway lighting and lighted signs for approximately 5700 feet of roadway and bridges. The following are approximate quantities of the major items:—

Luminaires, ballasts, and lamps	135
Standards	120
Concrete Foundations for Light Standards and Signs	80
Brackets	125
Wire	60,000 L. F.
Transformers	3
Transite Conduit	10,000 L. F.

All checks shall be made payable to the Delaware River Joint Toll Bridge Commission, which amounts shall be forfeited as liquidated damages if the bidder or bidders fail, within ten (10) consecutive calendar days after written notice that the bidder or bidders have been awarded the contract, to enter into a written contract with the Commission in accordance with the accepted bid, and to give a Performance Bond satisfactory to the Commission, equal to one hundred percent (100%) of total amount of contract.

The Commission reserves the right to waive any informalities in the bids received; to reject any or all bids; and to award the contract only to those experienced in this class of work, and to the bidder whose proposal is deemed by the Commission to be most advantageous to the public interest.

DELAWARE RIVER JOINT TOLL
BRIDGE COMMISSION
by: Alexander R. Miller
Chairman of Commission

Date, **April 2,** 1951

Bids: April 20, 1951

Permanent Operations Building

THE PORT OF NEW YORK AUTHORITY
NEW YORK INTERNATIONAL AIRPORT
AIRMAIL FIELD QUARTERS
CONTRACT NYA-210,001

Sealed proposals for the construction of airmail field quarters in the Permanent Operations Building at New York International Airport will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 Eighth Avenue, New York 11, until 2:00 P. M. Friday, April 20, 1951, and thereafter in the Auditorium of the Authority at the same address until 2:30 P. M., on the same date, at which latter time and place said proposals will be publicly opened and read.

Contract documents may be seen at the **office of the** Chief **Engineer and copies will be furnished upon deposit of $25 per set. The deposit will be remitted if the documents are returned in good condition, not later than 30 days after the opening of proposals.**

THE PORT OF NEW YORK AUTHORITY
Howard S. Cullman, Chairman.
New York, April 5, 1951

(Continued on page 72)

OFFICIAL PROPOSALS

(Continued from page 71)

Bids: April 11, 1951

State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.—Pursuant to the provisions of the Highway Law and the Canal Law, and special provisions for projects financed with federal aid funds, sealed proposals will be received until ten-thirty o'clock A.M., eastern standard time on Wednesday, April 11, 1951 by Henry A. Cohen, Director, Bureau of Contracts & Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following projects: Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts & Accounts, Albany, N. Y., and at the office of the District Engineers noted below, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for plans and proposal forms for each contract is indicated below. A refund will be made in full to bidders for the return of one set in good condition within 30 days of award or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
DISTRICT No. 1						
G. L. Nickerson, Dist. Engr., 353 Broadway, Albany N. Y.						
Schenectady	M-51-2	Lock No. 7, Niskayuna, N. Y.		Furnishing & Replacing Lock Gate & Lowering Sill	5% of Bid Plans $10	Not Published
Schenectady	M-98	Movable Dam No. 4, Scotia, N. Y. Movable Dam No. 5, Rotterdam, N. Y.		Furnishing & Replacing Gates & Replacing Substructures	$26,000 Plans $10	$470,627.50
DISTRICT No. 6						
H. F. Brumm, Dist. Eng., 30 West Main St., Hornell, N. Y.						
Yates	FASS51-11	Red Jacket Bridge-Milo Center, Pt. 1, Co. Rd. No. 105, Proj. No. S(786(2)	2.85	Bit. Dble. Surf. Treat. Cr. Stone	$9,000 Plans $15	165,000.00
DISTRICT No. 8						
J. S. Bixby, Dist. Engr., Pleasant Valley Road, Poughkeepsie, N. Y.						
Columbia & Dutchess	TSP 51-1 RC 51-6	Taconic State Parkway, Sec. 7, Pt. 3; 8; 9 Pt. 1; 9A, Pt. 2; 9B, Pt. 1; (Lake Taghkanic-West Taghkanic, Co. Rd. 12) Rock City-Lafayetteville, S. H. 628 West Taghkanic-Ancram, S. H. 9058	14.70	Grading & Structures = 12.35 Mi. Asph. Conc. Ty. 1A, Opt. = 1.97 Mi. 9' Cement Conc. Pavt. 48' Var. Wide = 0.38 Mi. Hy. Sep. Conc. Rigid Frame 50'-7" Span Br. 3 Sp. Alpha I-Beam 1 at 82'-10" and 2 at 80' 11" Hy. Sep. 2 Sp. Conc. Rigid Frame 44'-6" Each Hy. Sep. Conc. Rigid Frame 44'-1½" Span Alpha Royalty = $500.00	$200,000 Plans $100	3,835,000.00
Dutchess	FASS51-6	Stanfordville-Taconic State Parkway, Co. Rd. 19, Proj. No. S342(1)	4.21	Bit. Mac. Pen. Method, Type 1	$15,000 Plans $15	281,000.00
Orange	RC51-8	West Point-Central Valley, S. H. 5328-5328A Fort Montgomery-Highland Falls, S. H. 8078 Fort Montgomery-West Point Junction, S.H. 8526	2.61	Opt. Guide Railing	$2,500 Plans $10	45,000.00
Rockland	PIP51-2 RC51-10	Palisades-Interstate Parkway Pt 1 (Rte. 45 to Mt. Ivy) Suffern-Mt. Ivy, S. H. 1148 Mt. Ivy-Haverstraw, S. H. 1660 Spring Valley-Mt. Ivy, S. H. 1019	2.24 Cont. (1.93 Access)	Grading & Structures = 1.48 Mi. 9" Cem. Conc. Pavt. 24', 36' & Var. = 0.76 Mi (Access = Grading & Struct. = 0.80 Mi.; Cem. Conc. Pavt. = 0.21 Mi.; D. S. T. Gr. Grav. = 0.69 Mi. & Asph. Conc. Ty. 1A, Opt. = 0.23 Mi.) 4 Sp. I-Beam 2 at 53'-9" & 2 at 67'-6"	$65,000 Plans $25	1,167,000.00
DISTRICT No. 10						
J. J. Darcy, Dist. Engr., Montauk Highway at Little E. Neck Road, Babylon, L. I., N. Y.						
Queens	FAVWE51-1	Van Wyck Expressway, Cont.12, Proj. U1085(13)	0.48	8" & 9" Cem. Conc. Pavt. 2 at 25' Wide = 0.46 Mi.; Misc. Work = 0.02 Mi.; Hy. Sep. Pl. Gird. 83'-7¼" Sp.; Hy. Sep. 2 Sp. I-Beam 43'-4" & 43'-11½"; Hy. Sep. 2 Sp. I-Beam 44'-7" & 45'-3½"; Pedestrian Overpass 2 Sp. I-Beam 49'-3" & 39'-6"	$150,000 Plans $100	2,751,000.00

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of "State of New York, Commissioner of Taxation & Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Law, as set forth in "Instructions to Bidders".

When optional types are permitted on contracts with federal funds, bidders must state in the space provided in the proposal the exact designation of the optional type upon which the proposal is predicated.

The right is reserved to reject any or all bids.

B. D. TALLAMY
Supt. of Public Works

U. S. Government

UNITED STATES DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Invitation No. DS-3365) will be received by the Bureau of Reclamation, Denver, Colorado, until April 24, 1951, and then publicly opened for furnishing 4 motor-operated radial-gate hoists for Canyon Ferry Dam, Missouri River Basin Project, Montana. Delivery is desired within 365 days. For particulars, address Bureau of Reclamation, Building 1-A, Denver Federal Center, Denver, Colorado.

U. S. Government

Office of the District Engineer, Corps of Engineers, U. S. Army 1217 U. S. Post Office and Custom House, St. Paul 1, Minnesota.—Sealed bids, in duplicate, for furnishing all labor and materials and performing all work required for Reservoir Clearing, Stage No. 3, Lake Ashtabula (Baldhill Reservoir) Sheyenne River, North Dakota, will be received in this office until 2:00 P.M., C.S.T., April 18, 1951, and then publicly opened. Further information upon application.

OFFICIAL PROPOSALS

Bids: May 17, 1951

The Denver Municipal Water Works

1. Sealed proposals will be received by the City and County of Denver acting by and through its Board of Water Commissioners, at the office of the Board, in the City and County Building, Denver, Colorado, until 2 P.M., May 17, 1951, at which time and place they will be publicly opened and read, for the work hereinafter indicated.

2. The work to be done will include, among other items, the following: (Approximate quantities indicated where applicable).

Construction of Reservoir Number 22 Dam, major items of which will be:

Diversion and care of water	Lump sum
Clearing dam site	9 Acres
Tunnel excavation	4,600 cu. yds.
Tunnel timbering	12,000 Ft. b.m.
Excavation	123,000 Cu. yds.
Backfill	3,400 Cu. yds.
Drilling grout holes	14,885 Lin. ft.
Drilling drainage holes	6,000 Lin. ft.
Placing metal pipes for foundation grouting, drainage, contraction joint grouting, concrete cooling, formed drains	534,950 Lbs.
Pressure grouting foundation, tunnel, contraction joints, and cooling system	42,000 Cu. ft.
Installing cast iron drain pipe	29,600 Lbs.
Installing sewer pipe drains	600 Lin. ft
Placing reinforcing steel	400,000 Lbs.
Installing outlet conduits and valves	419,200 Lbs.
Mass concrete in dam (Cement furnished by Board)	588,800 Cu. yds.
Reinforced concrete (Cement furnished by Board)	3,110 Cu. yds.
Porous concrete (Cement furnished by Board)	10 Cu. yds.
Cooling concrete	475,000 Cu. yds.
Valve house	Lump sum
Placing metal sealing strip and grout groove covers	21,750 Lin. ft.
Installing stairs, trash racks, cranes, and miscellaneous metal	178,600 Lbs.
Placing expansion joint filler	850 Sq. ft.
Dumped riprap	600 Cu. yds.
Hand placed riprap	200 Sq. yds.
Overhaul	45,000 Cu. yds. per mile

3. All proposals shall be submitted in accordance with the Instructions to Bidders, and other related documents collectively referred to as the Contract Documents. Plans, Specifications and Contract Documents are now on file in the office of the Chief Engineer of the Board where they may be examined by prospective bidders. Contractors desiring sets of Contract Documents for use in preparing proposals may obtain them from the office of the Chief Engineer upon making a deposit of $10.00, which will be refunded upon the return of the documents, complete and in good order.

4. Each proposal must be accompanied by a proposal guaranty in the form of a bid bond in an amount not less than ten per cent (10%) of the proposal and in the form provided in the Contract Documents. The Contract Documents require the successful bidder to be ready to execute formal contract with adequate sureties immediately upon acceptance of bid by the Board.

5. The successful bidder will be required to furnish an acceptable surety company performance bond with adequate co-sureties to underwrite the full amount of the contract. The Board will use the current U. S. Treasury Department listing of sureties as prima facie evidence of the qualifications and limitations of sureties acceptable to the Board.

6. The Board of Water Commissioners reserves the right to reject any and all bids, and to waive technical defects, if the best interests of the City and County of Denver may be served thereby.

CITY AND COUNTY OF DENVER
Acting by and through its
BOARD OF WATER COMMISSIONERS
By George R. Morrison
President

U. S. Government

Office of the District Engineer, Corps of Engineers, U. S. Army 1217 U. S. Post Office and Custom House, St. Paul 1, Minnesota.—Sealed bids, in duplicate, for furnishing all labor and materials and performing all work required for Road Raise and Modification of Outlet Structure, Lower Red Lake, Minnesota, will be received in this office until 2:00 P.M., C.S.T., April 17, 1951, and then publicly opened. Further information upon application.

REPLIES (Box No.): Address to office nearest you
NEW YORK: 330 W. 42nd St. (18)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

POSITIONS VACANT

POSITION OPEN for engineer, construction man familiar with dock and pier building and pile driving who lives in Newark—Elizabeth, N. J., district. Write P-9221, Engineering News-Record.

WANTED: STRUCTURAL Engineers for pulp and paper mill design including mill layout and structural steel and reinforced concrete design. In first letter give complete engineering experience, age, education, etc. Address Construction Engineer, P. O. Box 1844, Savannah, Ga.

CONSTRUCTION EXECUTIVE Engineer: Capable of Office Management, estimating, buying sub-contracts, materials, solicitation of new business and field management. Unusual opportunity for aggressive person with proper qualifications. Give full experience, salary expected, age and availability in first reply. Joseph Skilken & Company, 44 E. Broad Street, Columbus 15, Ohio.

ENGINEER, CIVIL, Experienced in construction work drafting, quantity estimating, surveying and field supervision. First class man only. Write P. O. Box 1074, Roanoke, Virginia.

ENGINEER HIGHWAY. Excellent position, open immediately. Experienced superintendent highway construction. Maryland. Write giving age, education, technical training, experience, salary, when available. P-9300, Engineering News-Record.

DRAFTSMEN — STRUCTURAL Steel detailers and checkers experienced in making shop details for steel fabricating plant. All types of steel construction for buildings. State experience and rate expected. F. L. Heughes & Co., Inc., 1029 Lyell Avenue, Rochester, New York.

ENGINEER MECHANICAL, experienced in detail drafting, etc., for industrial piping installations. First class man only. Write P. O. Box 1074, Roanoke, Virginia.

STRUCTURAL STEEL Detail Draftsmen and Checkers. All types of Structures. Vacation and bonus plan, group insurance, good working conditions. Only top quality men. Send complete written information. Samborn, Steketee and Associates, 1214 Cherry Street, Toledo 2, Ohio.

WANTED: BRIDGE Designer; structural draftsman; small office. The Standard Engineering Corp., P. O. Box 1068, Albany, N. Y.

MAINTENANCE ENGINEER for Industrial Plant in the Metropolitan Area in Central New Jersey. Salary—Open. Age 25-45. P-9269, Engineering News-Record.

WANTED — CIVIL Engineer graduate, some construction experience preferred, by long established engineering promotional and educational organization, to be assistant office engineer in New York City. Age 20 to 40. Give resume of education, engineering experience, and salary requirements in reply. P-9266, Engineering News-Record.

FIELD ENGINEER with experience on large water mains and sewers—age 25 to 55—for work near Chicago. Salary range $5,000 to $6,000 per year. P-9370, Engineering News-Record.

LOOKING FOR a sprinkler engineer, preferable an energetic young man to take full charge of a sprinkler department. Must be able to draw, sell, and supervise men. To work in Connecticut. State salary wanted, qualifications and experience. P-9345, Engineering News-Record.

CIVIL ENGINEER Wanted, for design work on park and parkway development in the Detroit area. Five years generalized design experience in minor structures, utilities and roads, with some field experience desired. Personnel Manager, Huron-Clinton Metropolitan Authority, 1750 Guardian Building, Detroit 26, Michigan.

RESEARCH ENGINEER: Nationally known top-rated manufacturer desires services capable development engineer fully experienced metal panel construction for building walls, floors and roofs. Consideration given only to top flight man capable originating and developing to successful conclusion new ideas and improvements this field. Creative ability essential. Remuneration consistent past performance and future accomplishments. Give full particulars, photo and references. P-9351, Engineering News-Record.

WANTED: PIPING Draftsmen, structural engineers, industrial engineer. Murray Hill 3-7484. (N.Y.)

(Continued on page 74)

ENGINEERS

ELECTRICAL - MECHANICAL - STRUCTURAL

Openings in Ohio and New York offices offering long term employment with good salary for qualified Group Leaders, Designers and Draftsmen experienced in one or more of the following phases of industrial plant design:

Electrical	Power, lighting layouts and electrical controls.
Mechanical	Plant layout, process piping, conveyors, heating and ventilation, boiler houses, process equipment layout, refrigeration, plumbing, tanks and vessels, packaging equipment, special machinery and equipment.
Structural	Structural steel and reinforced concrete.

Please submit complete resume stating experience, education, salary required and availability date.

THE H. K. FERGUSON COMPANY
Engineers and Builders

The Ferguson Bldg. 1783 E. 11th St.
Cleveland 14, Ohio

19 Rector Street
New York 6, N. Y.

WANTED

STRUCTURAL & MECHANICAL DESIGNERS & DRAFTSMEN

CHICAGO AREA
48 Hour Work Week
Send resume and earliest date available to

John Mohr & Sons
3200 E. 96th St.
Chicago 17, Ill.

MECHANICAL SUPERINTENDENTS — Thoroughly experienced in process piping and mechanical equipment erection, including stainless steel pressure and acid vessels, pumps, glass piping, etc.

INSTRUMENTATION SUPERINTENDENT—Experienced in repair and installation of all types of control, indicating and recording instruments.

PURCHASING AND EXPEDITING PERSONNEL—Must have plenty of experience handling requisitions and orders for mechanical equipment, piping, etc., and aggressiveness to trace and expedite and get the materials on the job.

Send outline of experience to Atlanta offices of:

JOHN J. HARTE COMPANY
284 Techwood Drive Atlanta, Georgia

CONSTRUCTION SUPERINTENDENT

Experienced in construction of Open Hearth Plants. Must be a good organizer, able to handle labor and qualified to exercise executive ability. Compensation commensurate with ability of individual.

Write and furnish full information regarding education, training, chronological details of experience, age, salary expected, etc. All replies will be considered strictly confidential.

P-9381, Engineering News-Record
330 W. 42 St., New York 18, N. Y.

DESIGNERS and RETAILERS REINFORCED CONCRETE

Defense Work. Work will be performed in Chattanooga, Tennessee. Salary and position commensurate with experience. Qualified Engineers contact:

AAKE F. HEDMAN
Consulting Engineer
Chattanooga, Bank Building
Chattanooga, Tennessee

SALES ENGINEER

ENGINEERING and CONSTRUCTION

Large firm of Engineers and Constructors has opening in Pittsburgh for qualified Sales Engineer and Executive with contacts and recent experience in selling engineering and construction services. Submit complete information stating experience, education, personal contacts, references, date available and salary requirements. All replies will be treated confidentially.

SW-8869, Engineering News-Record
330 W. 42 St., New York 18, N. Y.

DESIGNERS, DRAFTSMEN, ELECTRICAL - MECHANICAL - STRUCTURAL. JOB LOCATED IN MIDDLE WEST. EXCELLENT WORKING CONDITIONS. GOOD SALARY. OLD ESTABLISHED COMPANY.

P-9385, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

PLANT & MAINTENANCE ENGINEER

Wanted, by national organization, for Middle-Atlantic location, graduate engineer, thoroughly experienced in plant engineering and maintenance. Must be free to travel. Give age, details of experience, salary expected, and when available for work. Write **Box EN 703, 221 W. 41 St., N. Y.**

ENGINEERS
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WE PAY THE HIGHEST RATES IN THE INDUSTRY.

IN ADDITION TO WAGES OUR EMPLOYEES SHARE ANNUALLY IN COMPANY PROFITS.

WE ARE WORKING 5 DAYS PER WEEK, 9 HOURS PER DAY. THESE POSITIONS PROVIDE PERMANENT, STEADY EMPLOYMENT.

Our continuous expansion and growth is permanent.

We need Engineers and Designers experienced in Blast Furnace, Steel Mill or Oil Refinery Design.

These openings offer excellent future opportunities for men with the following specific experience, training and background:

STRUCTURAL DESIGNERS

CONCRETE DESIGNERS

ELECTRICAL DESIGN DRAFTSMEN

ELECTRICAL DRAFTSMEN

PIPING DESIGNERS

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ENGINEERING DRAFTSMEN

MECHANICAL AND CONVEYOR ENGINEERING DRAFTSMEN

ELECTRICAL SQUAD SUPERVISOR

Our working conditions are of the best; our offices are well-lighted.

We want men who are qualified and have a genuine desire to develop and advance.

Write and furnish complete details of experience, training, education, background, age, salary desired, etc.

ARTHUR G.
McKEE & CO.
2300 CHESTER AVE.
CLEVELAND 1, OHIO

CONSTRUCTION SUPERINTENDENT

Experienced in construction of Blast Furnaces. Must be a good organizer, able to handle labor and qualified to exercise executive ability. Compensation commensurate with ability of individual.

Write and furnish full information regarding education, training, chronological details of experience, age, salary expected, etc. All replies will be considered strictly confidential.

P-9382, Engineering News-Record
330 W. 42 St., New York 18, N. Y.

WANTED

PROJECT ENGINEER

For Construction of

STEEL MILL FACILITIES

Minimum of 5 years' experience on heavy construction

Send complete resume

John Mohr & Sons
3200 E. 96th St. Chicago 17, Ill.

SPECIFICATIONS WRITER

Experienced in writing specifications for commercial and industrial buildings or mechanical and process plant installations. Either a knowledge of building materials and construction trades or mechanical equipment is necessary.

Long term openings in Cleveland office offering good salary for qualified applicants. Apply in person or send complete resume of experience, education and salary expected.

THE H. K. FERGUSON COMPANY
Engineers and Builders
Ferguson Building
Cleveland 14, Ohio

MECHANICAL ENGINEERS, DESIGNERS DRAFTSMEN for industrial plant equipment, chemical process piping, lay-out and detailing.
STRUCTURAL ENGINEERS-DESIGNERS of steel, concrete structures in industrial work.
CIVIL ENGINEER—DESIGNER experienced soil mechanics paving and drainage, pipe lines.

Send full particulars to:

JOHN J. HARTE CO.
284 Techwood Drive, Atlanta, Georgia

STRUCTURAL STEEL
DRAFTSMEN
DETAILERS AND CHECKERS
ONLY TOP RATE MEN
Write Qualifications
BERZIN, GEIST & LICHTENBERG
ENGINEERS
213 East 38 Street, New York 16, N. Y.

ENGINEERS WANTED

The Tennessee Valley Authority has openings for Civil, Structural, Mechanical, Electrical and Office Engineers and Architects for work in connection with the design and construction of large steam-electric and hydroelectric projects. The Design Engineer and Architect openings are located in Knoxville, Tennessee. Field and office engineering positions are located at construction sites at various points in the Tennessee Valley area and Paducah, Kentucky. Entrance salaries based on a 40-hour work week are $3900 and $4650 per annum, depending on training and experience, with provisions for automatic within-grade increases. Retirement, annual and sick leave benefits. Interested candidates should write to Tennessee Valley Authority, Division of Personnel, Knoxville, Tennessee.

CONSTRUCTION SUPERINTENDENT & ENGINEER

Wanted by well-established national organization. Must be graduate of technical college, and experienced in building construction and installation of equipment. Experience in chemical plants helpful. Must be willing to travel in continental U. S. State salary expected, and give detailed experience, together with age, and education. Write **Box EN 694, 221 W. 41 St., N. Y.**

GRADUATE STRUCTURAL ENGINEER

with some experience on concrete construction and capable of meeting the public. Promotional work with national organization in large midwestern city. Away from headquarters only one or two nights a week. Car furnished, expense account, good starting salary.

P-9363, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

CONCRETE DESIGNERS

Minimum 5 Yrs. experience in Foundation & Reinforced Concrete Design. Graduates preferred. Large long-range expansion program. Location of work Detroit, Mich. Qualified applicants write.

DETROIT EDISON CO.
2000 Second Ave., Detroit 26, Mich.

EMPLOYMENT SERVICE

SALARIED PERSONNEL, $3,000-$25,000. This confidential service established 1920, is geared to needs of high grade men who seek a change of connection under conditions assuring, if employed, full protection to present position. Send name and address only for details. Personal consultation invited. Jira Thayer Jennings, Dept. L, 241 Orange St., New Haven.

POSITIONS WANTED

CONSTRUCTION SUPERINTENDENT available soon. Age 40. Good health. Energetic. Specialist concrete and wooden structures. Twenty years varied experience heavy construction; cofferdams; sewers; dams; bridges; army camps defense plants; more recently large housing projects. Southeastern U. S. or Caribbean area preferred. Allen McSherry, P. O. Box 2108, Miami, Fla. Phone 89-1686.

DETAILER-ESTIMATOR, Structural; College man 12 years experience desires position in middle west. Presently employed in charge of structural for fabricator struct. & reinf. Wash., D. C. Available 4 to 6 weeks. Reply PW-9268, Engineering News-Record.

CONST. ENGR., C.E. Grad., Vet, 5 yrs. experience in industrial construction last 2 in power plants. Graduate work in power engineering. Write PW-9265, Engineering News-Record.

PUMPCRETE OPERATOR A1, fifteen years experience tunnel work. Address (Engineer), 817 Rose St., McKees Rocks, Pa.

Don't forget
THE BOX NUMBER . . .
when answering the classified advertisements in this magazine. It's our only means of identifying the advertisement you are answering.

POSITIONS WANTED

SUPERINTENDENT—20 Years experience. Operation & Maintenance, Water Wks, Sewage, Stream Pollution, Chemical & Non-Metallic Mineral Plants. Also Construction, Mechanical Installation and all types of Heavy Equipment. Will relocate. Write Box 2202, Richmond, Virginia.

GRADUATE CIVIL Engineer, age 30, available May 15. Eight years of experience including building construction, cost engineering, highway work, and rental equipment. Now located in Chicago area, but will relocate. PW-9290, Engineering News-Record.

CHIEF ACCOUNTANT-Office Manager. Experienced various construction projects foreign areas. Also professionally experienced in office procedures and management controls. Speaks Spanish fluently. Now employed in U. S. desires foreign position or will accept suitable domestic assignment. PW-9298, Engineering News-Record.

ENGINEER, CONSTRUCTION C.E. Graduate, 25 years office and field experience design construction all types structures. Estimating, pricing, closing contracts, coordination. Wishes position as contractors' engineer or architects' representative. Some foreign experience. Locate anywhere. PW-9312, Engineering News-Record.

PROJECT MANAGER, general superintendent. Experience includes all details of entire heavy and light building and allied constr. 30 yrs. exp. Salary $12,000 per year. PW-9329, Engineering News-Record.

ASPHALT SUPERINTENDENT, 30 years experience, asphaltic concrete, binder sheet top, and water bound macadam bases, application, both hot and emulsified asphalt, familiar, Warren Cummer, H-B., and Simplicity Plants, married, sober, and free to travel. PW-9346, Engineering News-Record.

GRADUATE CIVIL Engineer, some construction experience. Single, good health, desires foreign work. PW-9347, Engineering News-Record.

GENERAL SUP'T available April 15, now in charge of heavy construction projects, such as power houses, filtration and sewage plants, industrial buildings and multiple housing. Well versed in administrative procedures and all type contracts, 30 years experience, age 48. Complete resume upon request. Min. salary, $225.00 wk. PW-9353, Engineering News-Record.

MASTER MECHANIC. Equipment Supt., over 25 years experience with erection, repair, maintenance heavy industrial, power house, pumping stations, marine equipment. P. Cornwell, 6824 Colonial Rd., Brooklyn 20, N. Y. TErrace 6-6236.

OFFICE MANAGER, Accountant, Auditor—Now employed desires foreign contract. 16 years diversified experience in heavy, refinery and housing construction. All phases of general and cost accounting, payroll and timekeeping. PW-9368, Engineering News-Record.

ARCHITECTURAL DRAFTSMAN; Structural engineer wants position with industrial or construction concern. PW-9375, Engineering News-Record.

SALES-ENGINEER available for the State of Colorado. Wish to represent Manufacturer of Building or Engineering products. Prefer one manufacturer on exclusive basis. 9 years Design Engineer with top Power Plant and Industrial Engineers, including designing, checking, estimating. 6 years Sales-Engineer, including take-offs, estimating and selling. Willing worker. Excellent references. Correspondence invited. E.G.W., 1611 West Cheyenne Road, Colorado Springs, Colorado.

BUSINESS OPPORTUNITIES

Wanted Electrical Work.

Complete charge or assistant. Can Layout-Estimate-purchase materials-Own catalog files. Age. 39. Will sub-contract, you finance. Phone Peekskill 7-0192. BO-9259, Engineering News-Record.

Wanted to purchase—

small to medium sized construction equipment business located Midwest, West or Southwest, preferably. Reply BO-9349, Engineering News-Record.

PATENT ATTORNEY

Consult: Z. H. Polachek

Reg. Patent Attorney, 1234 Broadway, New York 1, N. Y.

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Any Trade and Type of Project

Literature and Sample on request

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1	12" BP 74# x 22' 3"
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1	16" WF 64# x 20' 6"
3	18" I 60# x 22' 9"
3	18" I 60# x 23' 9"
2	18" WF 105# x 20' 9"
3	20" I 70# x 35' 8"
6	20" I 80# x 35' 8"
1	21" WF 68# x 12' 10"
1	21" WF 68# x 15' 6"
1	21" WF 68# x 16' 0"
1	21" WF 68# x 33' 4"
1	21" WF 68# x 35' 8"
4	21" WF 73# x 23' 3"
2	21" WF 82# x 18' 4"
2	21" WF 82# x 43' 0"
2	21" WF 112# x 21' 0"
1	21" WF 127# x 25' 6"
1	21" WF 142# x 26' 3"
2	24" I 79.9# x 17' 6"
2	24" I 79.9# x 17' 10"
1	24" I 79.9# x 18' 8"
2	24" I 79.9# x 23' 0"
2	24" I 79.9# x 29' 10"
1	24" WF 80# x 29' 6"
3	24" WF 80# x 31' 2"
10	24" WF 84# x 16' 11"
10	24" WF 84# x 17' 4"
5	24" WF 84# x 29' 9"
5	24" WF 84# x 30' 3"
1	24" I 90# x 30' 0"
2	24" I 100# x 36' 0"
2	24" I 105.9# x 31' 3"
1	27" WF 102# x 28' 8"
1	27" WF 102# x 54' 2"
1	27" WF 141# x 52' 10"
1	27" WF 141# x 67' 4"
1	33" WF 141# x 32' 0"
1	36" WF 160# x 30' 10"
2	36" WF 245# x 21' 4"
1	36" WF 260# x 44' 8"

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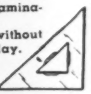

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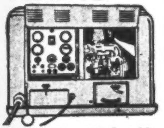

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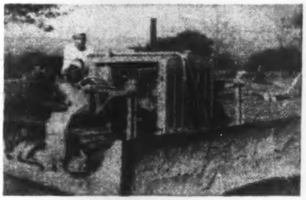

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FS-9305, Engineering News-Record
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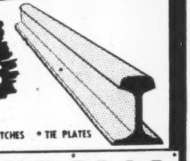

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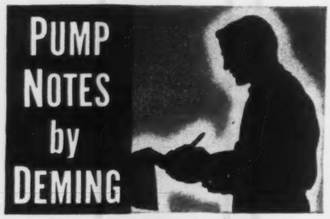
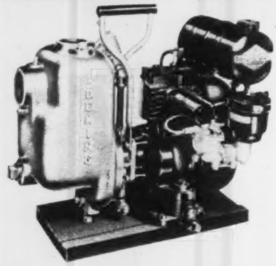




Ready for Action..
Anywhere..Anytime

Easily handled by one man, the Deming Fig. 3304 Self-Priming Centrifugal Pump illustrated is always ready for action on a wide variety of drainage and water handling jobs.

PERFORMANCE RATINGS

Gallons per Minute	Total Head in Feet
10	80
20	75
30	70
40	65
50	57
60	50
70	40
80	30
90	15

Fig. 3304 is a close coupled pump, made in bronze fitted, all iron, or all bronze construction, as required.

Impeller is mounted directly on engine shaft. Double mechanical type seals are furnished exclusively with all pumps.

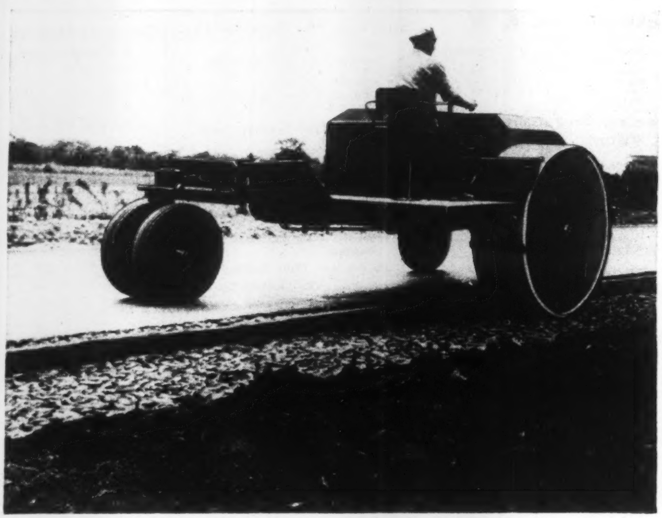
Unit shown has Briggs & Stratton, Model "NP" 1½ H.P., 4-cycle, air cooled gasoline engine having a high tension magneto.

This is one of various types of Deming Self-Priming Centrifugal Pumps described in Bulletin No. 3300-B. Write for a copy.

THE DEMING COMPANY
536 BROADWAY • SALEM, OHIO

SPECIFY DEMING PUMPS

NEW PRODUCTS



Trench roller works in depths to 25 inches

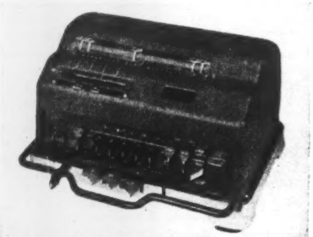
Features of the Galion trench roller include hydraulic operation of the dual steering wheels and of the leveling wheels. Adjustments are provided to quickly level roller to suit any trench requirements. Frame has sufficient clearance to enable roller to work in any depths to 25 in. Hydraulic control keeps the machine on a level or horizontal plane from 6 in. above to 25 in. below road surface. Compaction effort varies from 310 lb (roll empty) to 370 lb per lineal inch of roll width. Compression roll has front and rear tension scrapers and mats for moistening rolls when compacting finish materials. Large variable weight compression roll does not shove materials.—THE GALION IRON WORKS & MFG. CO., GALION, OHIO.

Explosion-proof motors

New line of motors is available in ratings from ½ through 60 hp at 230, 250, 500, and 550 volts, with stabilized shunt, compound, or series windings. Brushes are accessible through handhole covers in the upper half of the commutator end shield. Standard motors are foot mounted, but modifications can be supplied less the feet for strap mounting, or with a face or flange and shield.—GENERAL ELECTRIC CO., APPARATUS DEPT., SCHENECTADY 5, N. Y.

◆

Correction—The report on the Joy rotary air-blast drill (Mar. 15, p. 90) states that the drill's footage in dense, hard dolomite is 1½ ft per hr. This was caused by misinterpretation of the job data from which the story was prepared. Actually, footages attained in this material were 20 ft per hr, indicating that the drill is well equipped to handle operations in tough, hard rock.



Calculating machines

Swedish-made calculator features simplicity of design and ease of operation. It has a 2-bank keyboard with ten digits, permitting one-hand operation—leaving the other hand free for paper work. All processes are fully visible to the operator so that each figure set can be instantly checked in its register. Facit machines are available in four models. The TK is a small hand-operated calculator equipped to han-

(*Continued on page 84*)

Specify Protection in Mobilization Construction

Industrial construction for mobilization will give longer, more dependable service if you specify the *protection* of Monsanto Penta for the lumber you employ.

Monsanto Penta (pentachlorophenol) protects against termites and other wood-boring insects and controls decay caused by fungi. Treated with properly formulated Monsanto Penta, wood can be painted or varnished.

Write for details on *how to specify* penta treatment for lumber . . . for names of companies that can supply material treated with Monsanto Penta . . . for firms able to custom-treat your lumber . . . for brands of formulations with which you can do your own treating effectively. MONSANTO CHEMICAL COMPANY, Organic Chemicals Division, 1700 South Second Street, St. Louis 4, Missouri.

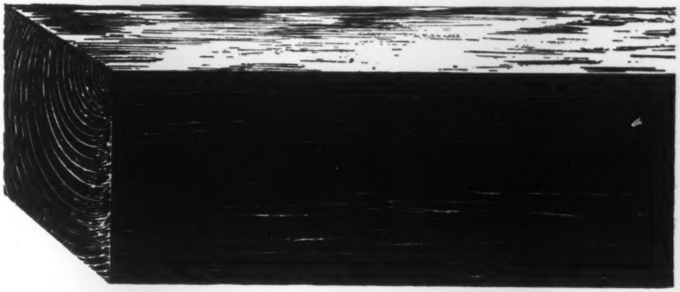
DISTRICT SALES OFFICES: Birmingham, Boston, Charlotte, Chicago, Cincinnati, Cleveland, Detroit, Houston, Los Angeles, New York, Philadelphia, Portland, Ore., San Francisco, Seattle. In Canada, Monsanto (Canada) Ltd., Montreal.

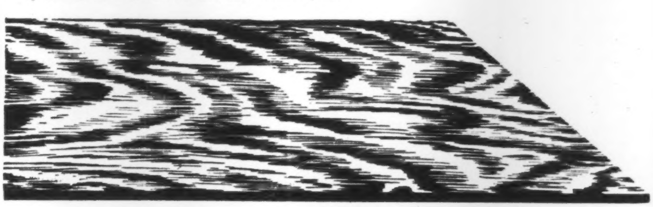
Typical uses of penta-treated wood

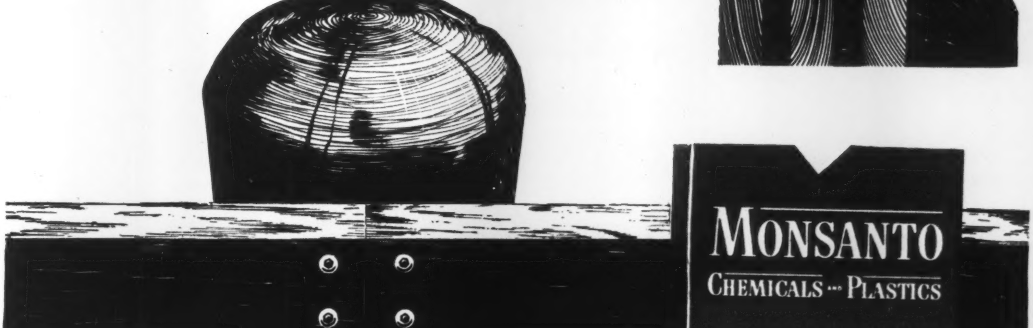
Wherever wood is used, penta treatment will give it longer life. The following table gives the amount of 5% penta solution in oil that a cubic foot of wood should retain for maximum protection.

	Humidity average to low	Humidity average high
Sills and plates	6	8
Joists and girders	6	8
Screeds and subflooring	6	8
Factory flooring	6	8
Roof plank	6	8
Platforms and decking	6	8
Posts and fences	6	8
Cooling towers	. .	8-10
Sign material	6	8
Millwork	6	8
Highway guardrails	6	8
Railway cars	6	8
Bridge timbers	8	10-12
Utility poles	8	8-10
Crossarms	6	8

Note: Higher treatments are recommended where wood is to serve under severe conditions, such as in the tropics. Recommendations will be furnished on request.





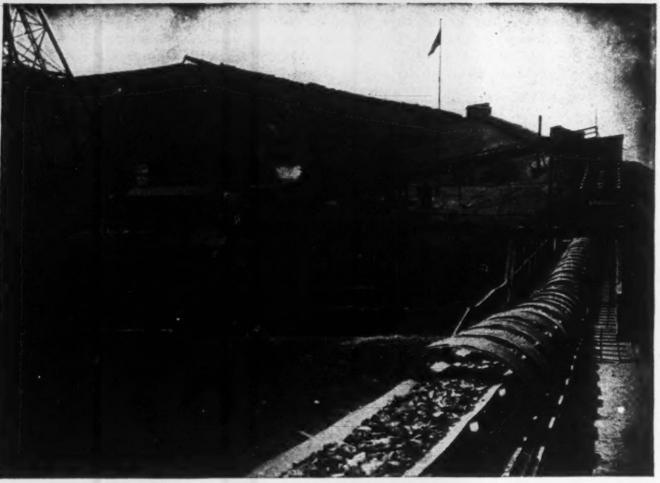


MONSANTO
CHEMICALS ··· PLASTICS

SERVING INDUSTRY . . . WHICH SERVES MANKIND

BELTING

BUILT FOR THE TOUGH JOBS!



HEWITT-ROBINS Conveyor Belting gives longer service at less cost

When trouble comes by the ton . . . whether it's heavy abrasives like ore and rock or wet, gritty materials like fines and slag . . . the easiest, most dependable and most economical way to move it is on a Hewitt-Robins conveyor belt.

For over half a century the Hewitt Rubber Division of Hewitt-Robins Inc., has pioneered in making the right belt for every conveyor installation. Today, engineers the world over instinctively specify Maltese Cross® where the going is really tough, Ajax® for general service, and Conservo® for lighter applications and portable conveyors.

In Hewitt Rubber belting they get full protection against moisture, oils, flexing and ply-separation, as well as treatment against mildew. They get abrasion-resistance from extra-tough rubber covers, heavily textile-reinforced for maximum strength plus flexibility.

* * *

Engineers turn to Hewitt-Robins not only for belting but for entire belt conveyor systems. They know Hewitt-Robins is *the only firm able to accept complete responsibility*. For belting, address Hewitt Rubber Division, Buffalo 5, N. Y.; for machinery, Robins Conveyors Division, Passaic, N. J.; for engineering services, Robins Engineers Division, 157 Chambers St., New York.

HEWITT-ROBINS

CONVEYOR BELTING

HEWITT-ROBINS INCORPORATED

BELT CONVEYORS (*belting and machinery*) • BELT AND BUCKET ELEVATORS
CAR SHAKEOUTS • DEWATERIZERS • FEEDERS • FOAM RUBBER PRODUCTS
FOUNDRY SHAKEOUTS • INDUSTRIAL HOSE • MINE CONVEYORS • MOLDED RUBBER GOODS
RUBBERLOKT ROTARY WIRE BRUSHES • SCREEN CLOTH • SKIP HOISTS • STACKERS
TRANSMISSION BELTING • VIBRATING CONVEYORS, FEEDERS AND SCREENS

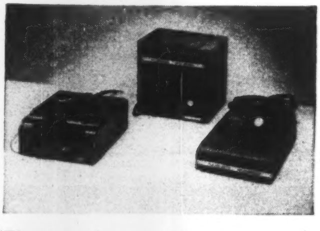
dle the four basic mathematical processes. The Lx, also manual, has a larger capacity than the TK. The NEA is an electrical unit with automatic division and semi-automatic multiplication. The ESA-O is fully automatic for calculations where higher speed is essential.—FACIT, INC., 500 FIFTH AVE., NEW YORK 17, N. Y.

Easy-pour tilter

Steel cradle on easy-pour tilter (Model 15) fits standard 5-gal cans. It is designed to provide a safe and easy method of pouring liquids into small containers. Or, its rocking motion can be used to mix various liquids together. — GENERAL SCIENTIFIC EQUIPMENT CO., 2700 W. HUNTINGTON ST., PHILADELPIA 32, PA.

Roof resurfacer

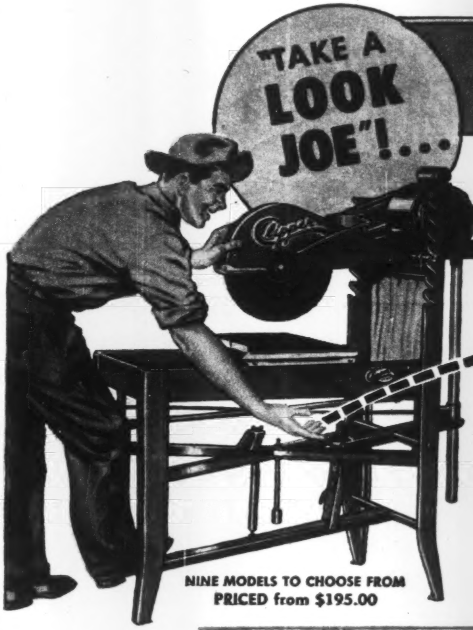
Roof coating and plastic cement can be applied on wet roofs, the manufacturer states. Known as Wet Surface Rufferseal, it is said to cut through surface moisture and resaturate roofing materials below with asphaltic oils. Also available is a plastic cement known as Wet Surface Rufferseali t used for patching wet roofs, copings, and flashings.—THE MONROE CO., INC., 10703 QUEBEC AVE., CLEVELAND 6, OHIO.



Electronic secretary

Automatic telephone-answering machine provides constant service when personnel in job field offices must

(*Continued on page 87*)


"TAKE A LOOK JOE"!...

NINE MODELS TO CHOOSE FROM
PRICED from $195.00

. . . I made this cut with my new CLIPPER in just 10 SECONDS!

"... and Joe, look at the smooth, straight edges on that material—they're perfect! The finished job looks better, costs less and can now be completed in record time."

Yes... CLIPPER MASONRY SAWS Make *Any* Cut Quickly and Easily!

Regardless of the material hardness—a Clipper Masonry Saw will cut any shape in record time and with smooth simplicity that will amaze you. . . . And with the MODEL HD you can choose your cutting method — cut DUSTLESS in confined areas or Dry for outside operations. Remember too, there are NINE Clipper Models — each designed to economically handle your specific masonry cutting needs.

FREE TRIAL...

The outstanding policy of "FREE TRIAL" has been in effect since Clipper invented the world's first Masonry Saw many years ago! Only through this Clipper "FREE TRIAL" are you guaranteed . . .

- **ACTUAL TEST ON THE JOB**
- **FULL SATISFACTION**
- **NO OBLIGATION**

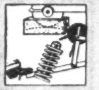
SOLD ONLY DIRECT From FACTORY To USER

Masonry cutting is a highly specialized field demanding direct Factory-To-You service which Clipper trained technicians can give you.

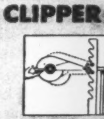
Your assurance of permanent satisfaction with your Clipper Products is doubled by our Policy of . . .

- **DIRECT ATTENTION..**
  - **DIRECT SERVICE..**
    - **DIRECT RESULTS..**

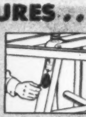
EXCLUSIVE CLIPPER FEATURES...



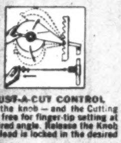
PRESSURE EQUALIZER
● Makes your blades last longer . . . Because Equalizer Spring automatically cushions blade pressure whether cutting HARD or SOFT materials. Outstanding for blade economy.



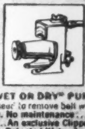
SELECT-A-NOTCH
● One man easily adjusts Cutting Head to desired height . . . Whether cutting 12" or 1" material. Operator's hands merely guide. Weight supported by rear Bar.



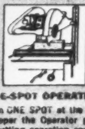
SAVE-A-BLADE DIAL
● Just turn the Save-A-Blade Dial to the material hardness and the Pressure Equalizer Spring automatically sets the tension — guarantees faster cutting and longer blade life.



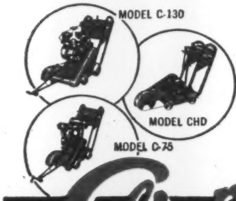
ADJUST-A-CUT CONTROL
● Pull the knob — and the Cutting Head is free for finger-tip setting at any desired angle. Release the Knob — and Head is locked in the desired position.



"WET OR DRY" PUMP
● No need to remove belt when cutting dry. No maintenance . . . Factory Sealed . . . An exclusive Clipper development. Patented Water Application Unit controls flow.



ONE-SPOT OPERATION
● From ONE SPOT at the front of his Clipper the Operator performs every cutting operation and makes every saw adjustment.



. . . *and Now Available-* CLIPPER CONCRETE SAWS

Six new "Job-Tested" models—gasoline or electrically powered and in sizes for all concrete cutting from Highway work to Patch work . . . and exclusive with Clipper—a unit which converts a masonry saw to a Concrete or Track Saw. Free literature on request—check and mail coupon.

Serving the World As the World's Largest Manufacturer of Masonry Saws

Clipper
NATION-WIDE DIRECT FACTORY SERVICE
MANUFACTURING CO.
KANSAS CITY 8, MISSOURI
Cable Address CLIPPER K. C. Mo.
PITTSBURGH • ST. LOUIS • NEW YORK • WASHINGTON, D.C.
SAN FRANCISCO • CHICAGO • CLEVELAND • PHILADELPHIA
AUSTIN, TEX. • DETROIT • CINCINNATI • ATLANTA • BOSTON

DRY ABRASIVE
DIAMOND BLADE
WET ABRASIVE

CUT WET or CUT DRY
There's a Clipper Blade for Every Job!

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CLIPPER MANUFACTURING COMPANY
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SEND FREE INFORMATION AND LITERATURE ON:

☐ NEW CLIPPER MASONRY SAWS
☐ DUSTLESS MODEL HD
☐ CLIPPER CONCRETE SAWS
☐ FREE TRIAL

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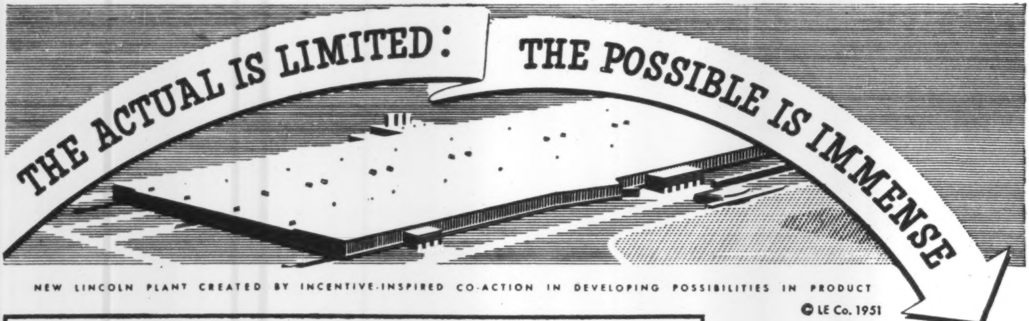
CITY________________ STATE________________


THE ACTUAL IS LIMITED: THE POSSIBLE IS IMMENSE

NEW LINCOLN PLANT CREATED BY INCENTIVE-INSPIRED CO-ACTION IN DEVELOPING POSSIBILITIES IN PRODUCT

© LE Co. 1951

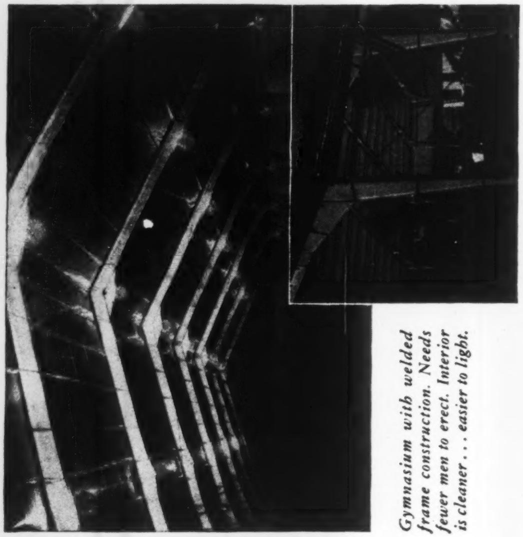
WELDED DESIGN CUTS STEEL TONNAGE 20%

By **David R. Graham**
Consulting Engineer
Tulsa, Oklahoma

It has been shown that savings of 20 per cent in the tonnage of steel can be made by taking advantage of the rigidity of welded connections in the design of a structure. It may be stated safely that the cost of a building is dependent far more on planning than it is on current cost levels.

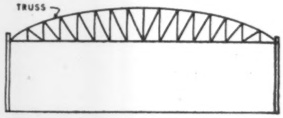
By utilizing the structural rigidity of welded frames in the example shown, six to eight feet of height in masonry walls can be eliminated. For a building of 80′ x 120′ this means a reduction in cost of $6000 based on $2 per square foot of wall area . . . a saving of 6 to 10 per cent in total cost of construction.

Welded structures can also be erected in less time. Frame members are shop fabricated at low cost with fast, downhand welding. Field connections are then bolted, guyed and welded in less time and with less scaffolding than required with other types of construction.



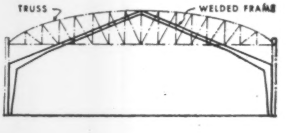
Gymnasium with welded frame construction. Needs fewer men to erect. Interior is cleaner . . . easier to light.

the ACTUAL



Traditional Design *costs $8 to $10 per square foot. Needs higher exterior walls and additional masonry.*

increasing the YIELD



Welded Frame Construction Saves 50%. *Cost is only $40,000 or $4.16 per square foot for building 80′ x 120′.*

the IMMENSITY of the POSSIBLE

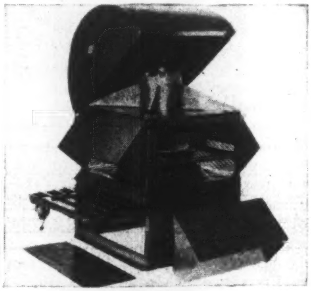
**more space,
more headroom
per dollar**

SEE HOW WELDED DESIGN BUILDS BETTER BUILDINGS

Studies in Structural Arc Welding free on request. Write on your letterhead to Dept. 132,

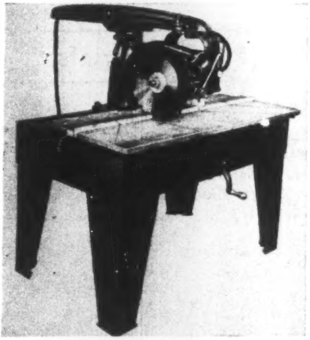
THE LINCOLN ELECTRIC COMPANY
CLEVELAND 1, OHIO

leave telephones unattended. This unit answers the 'phone, takes messages, and tells the caller when his party will return. In case of an emergency at night, the Electronic Secretary can be set to tell the caller where his party can be reached. The unit is easily installed, and is not connected to the 'phone. As an extra feature, it can be used as a portable dictation machine. —ELECTRONIC SECRETARY DISTRIBUTORS, INC., 801 W. NATIONAL AVE., MILWAUKEE 4, WIS.



Power roof ventilators

Type PRV ventilators are offered in 11 sizes, each available in 2 to 4 different speeds. The unit features a direct-connected centrifugal fan and motor. Weather-tight housing eliminates need for high-profile curbing. An optional feature is sprayed-on insulation to prevent condensation forming on inside of housing.—ILG ELECTRIC VENTILATING CO., 2850 N. CRAWFORD AVE., CHICAGO, ILL.



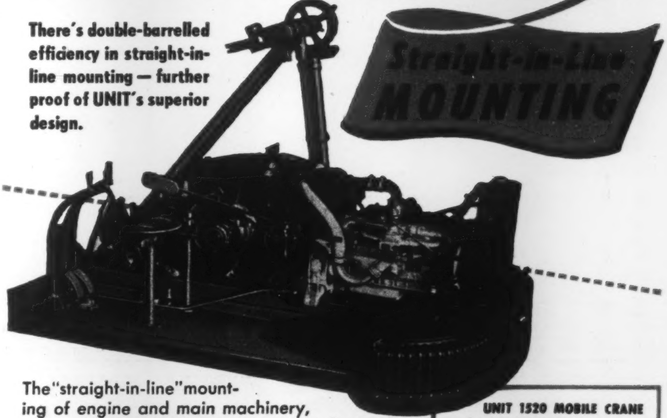
Radial arm saw

Receding-arm saw (Model R-2) is powered by a low dead-rise motor. This motor is said to permit greater depths of cut, because of reduced interference of the bottom of the motor resulting in the arbor being brought closer to the material being cut. The

(Continued on next page)

1 of 10 Reasons Why
UNIT is a Better Machine

There's double-barrelled efficiency in straight-in-line mounting — further proof of UNIT's superior design.



The "straight-in-line" mounting of engine and main machinery, in every UNIT, contributes substantially to the life, performance, and efficiency of the machine. Power is transmitted through a worm-driven power take-off, and the reduction from engine speed to main machinery is accomplished in just "one step." This simple method eliminates many wearing parts, minimizes friction losses, and prevents dissipation of power. This modern arrangement fits compactly into smaller space, providing an extremely low overhead clearance with ample space on both sides of engine and main machinery. With this type of installation, weight is more evenly distributed, and all working parts operate in perfect alignment.

UNIT 1520 MOBILE CRANE

A ruggedly built, self-propelled rubber-tired crane—operated by ONE man—powered by ONE engine—Hook Roller construction—Air Brakes—Hydraulic steering—4-speed Air-actuated Transmission. Heavy duty, yet operated with remarkable Speed, Safety, and Economy.

5th of a series of ten ads describing outstanding UNIT features.

UNIT CRANE & SHOVEL CORP., 6315 W. Burnham St., Milwaukee 14, Wis., U.S.A.

Crawler and Mobile models — ½ and ¾ Yd. Excavators. Cranes up to 20 tons capacity.

UNIT

SHOVELS • DRAGLINES • CLAMSHELLS • CRANES • TRENCHOES • MAGNETS

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DRILLING CONTRACTORS

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Foundation Testing for Bridges, Dams and All Heavy Structures

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Manufacturers of Diamond and Shot Core Drills, Accessories and Equipment

SPRAGUE & HENWOOD, Inc.
Scranton, Pa. Dept. E, U. S. A.

M-SCOPE PIPE FINDER

MODEL AB

ONE MAN OPERATION

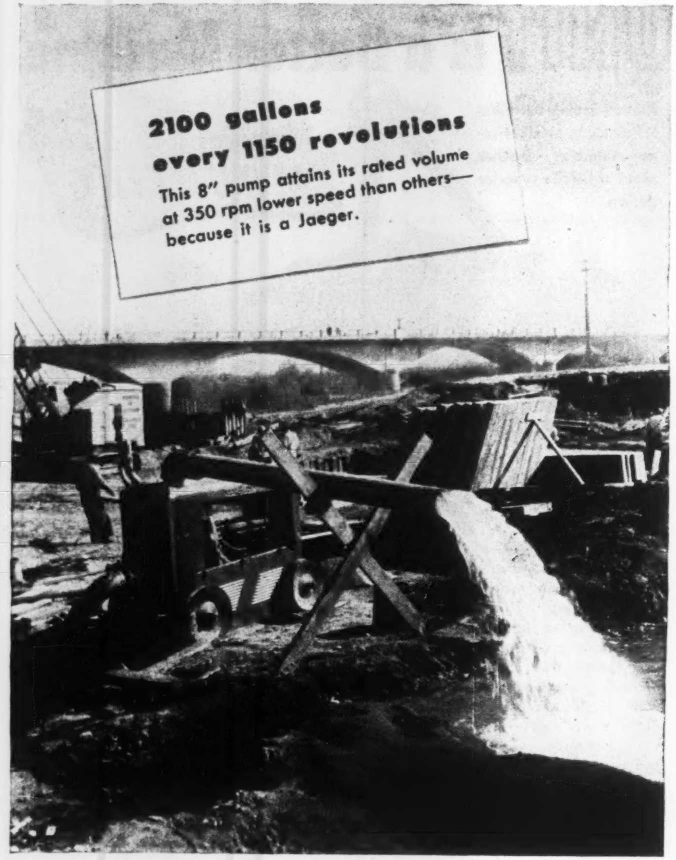
METAL CABINETS

HEAVY DUTY PERFORMANCE

ONLY
$149.50

FISHER RESEARCH LAB., Inc.
Dept 1 PALO ALTO CALIFORNIA

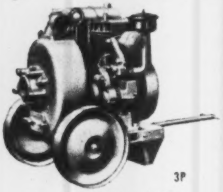
JAEGERS pull stronger, pump longer



2100 gallons every 1150 revolutions

This 8" pump attains its rated volume at 350 rpm lower speed than others—because it is a Jaeger.

Because Jaeger dewatering pumps are built oversize, to produce full rated volume at easier speeds, they also hold more priming water and are subject to less abrasive wear. Combined with double priming action and positively lubricated seal (Jaeger patents) they insure fast, sure priming without vapor lock on the toughest pulls, sustained efficiency on non-stop pumping, and thousands of extra hours of service from both pumps and engines.



Other sizes 1½" to 10".

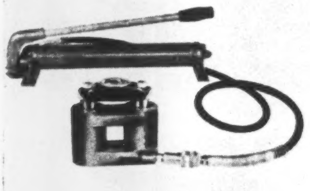
See your Jaeger distributor or send for Catalog P-10.

THE JAEGER MACHINE CO.

200 Dublin Ave., Columbus 16, Ohio

COMPRESSORS • MIXERS • HOISTS • TOWERS • PAVING MACHINERY

machine is available in 3- and 5-hp models—12 in. blades are recommended for the smaller models; 14 in. blades, for the larger.—DEWALT, INC., DEPT. P-46, LANCASTER, PA.



Hydraulic puller

Power-Twin hydraulic puller weighs less than 10 lb, yet develops up to 15 tons of power. It features a center hole that makes it adaptable to all OTC pulling systems now in use. The Power-Twin is 5¼ in. high, and can be used in any position. Ram travel is 2 in.—OWATONNA TOOL CO., CEDAR ST., OWATOONA, MINN.

Lightweight building blocks

New method for making blocks from sawdust and cement is said to result in a fire-resistant lightweight product. The blocks measure 8x8x16, and can be sawed, nailed, or drilled. No special curing is required, and the blocks can be air-dried in temperatures of 70 deg.—ROMAN NEJELSKI, 1400 W. WASHINGTON BLVD., FORT WAYNE, IND.

New Product Briefs

Fiberglas building insulation is now available in longer rolls requiring less cutting and fitting, and fewer packages to handle. Fiberglas is a product of: Owens-Corning Fiberglas Corp., Toledo 1, Ohio.

Pengo earth augers are now produced in 10 and 12-in.-hole sizes. These augers fit Highway, Williams, and Trackson earth-boring machines. Adapters are available for use on other makes. Pengo augers are made by: Petersen Engineering Co., Santa Clara, Calif.

Chromated anti-rust paints can be applied without previous wire brushing or scraping. Rustrem chromate special is produced by: Speco, Inc., Cleveland 9, Ohio.

CUT DIGGING COSTS

with the new Sherman Power Diager

Patented, actuated bucket gives you selective digging action, better loading, greater versatility.

All-hydraulic action—made possible by heavy-duty hydraulic cylinders—assures efficient performance.

SPECIFICATIONS

Shovel reach below ground surface	8 feet
Digger reach behind tractor	10 feet
Swinging arc	140°
Trench width, standard digging shovel, single cut	18 inches
Digging shovel capacity	3.5 cu. feet
Loading shovel capacity	5 cu. feet
Loading clearance, digging shovel, loaded	7 feet
Loading clearance, loading shovel	10 feet

Standard tractor mounting gives unmatched maneuverability and transportability.

•

Digs ditches, trenches, footings, culverts, basements and other excavations.

Works well behind the tractor at any angle.

•

Actuated bucket raises high enough to load standard dump truck.

•

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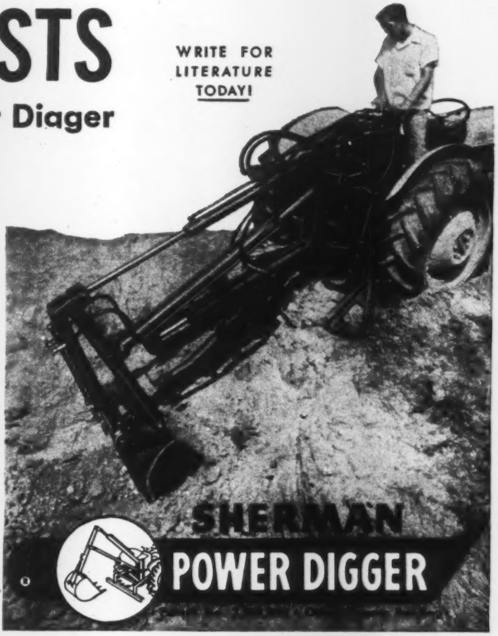

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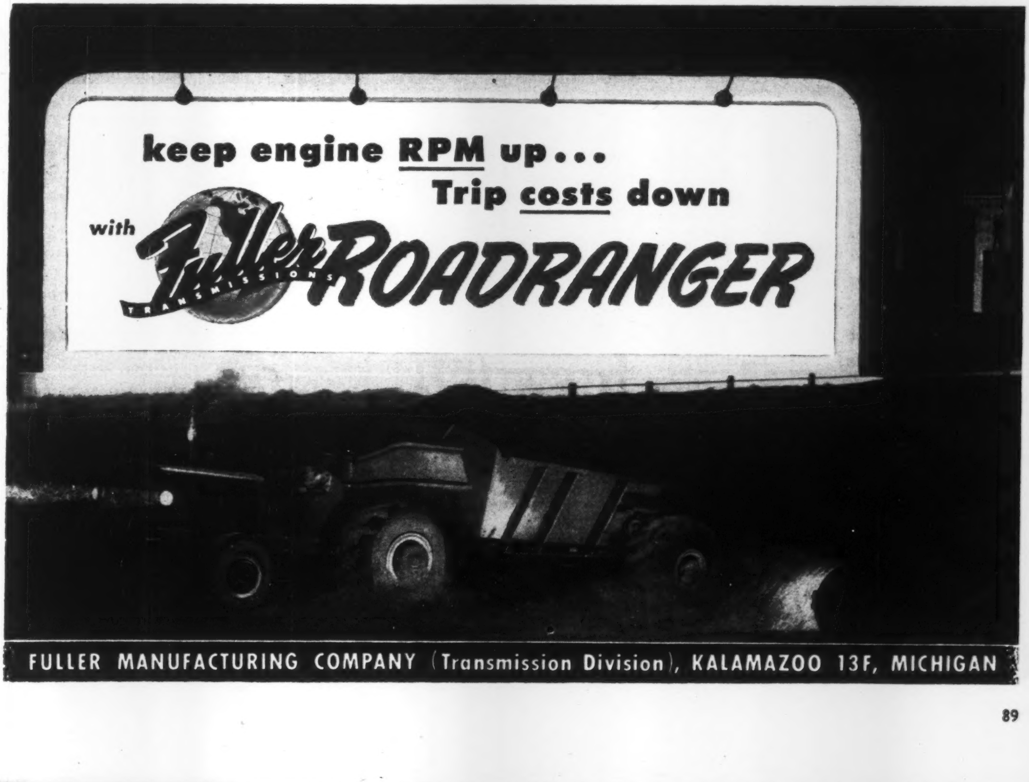

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MANUFACTURERS' PUBLICATIONS

Fluorescent lighting—Catalog section contains illustrations, descriptions, and listings of the Magna-Flo lighting units for use with slimline fluorescent lamps. The section contains lighting data, mounting data, and other specifications. Featured is a description of the Springlox lampholder, and the advantages said to accrue from its use.—BENJAMIN ELECTRIC MFG. CO., DES PLAINES, ILL.

Foundation structures—Brochure (24 pp) on drilled and poured foundation structures describes the complete services of a drilling contractor. Types and applications of foundation structures, pressure grouting, drainage, dewatering, shoring, and subsurface soil exploration are illustrated and described in case-history fashion. Included are tables for assistance in estimating drilled and poured foundation piling and caissons. One table covers volumes of different diameter caisson bells in relation to various size shafts.—CASEY & CASE FOUNDATION CO., P. O. BOX 151, MAYWOOD, CALIF.

Sanitary landfill—Informative descriptions of this type of refuse and garbage disposal is presented in a 16-p booklet entitled, "A Look to the Future With Sanitary Landfill." The booklet discusses various aspects of the problem, and shows how a typical community met them. The booklet is designed to serve as a guide to proper site selection, choice of the right equipment to do the job, and the actual operation of sanitary fills. The booklet features comic-book treatment.—CATERPILLAR TRACTOR CO., PEORIA 8, ILL.

Pumpcreting—Bulletin describes the Pumpcrete machine and methods of pumping concrete through pipelines. It indicates on which types of jobs Pumpcrete will work to advantage; what types of mixes it will handle; and the height and distance requirements of a placing job.—CHAIN BELT CO., 1633 W. BRUCE ST., MILWAUKEE 4, WIS.

Drainage calculator—Slide-rule is set up to determine the right size and shape of drainage structures for specific applications. Knowing runoff index and number of acres to be drained, a single setting of the slide determines required cross-section of structure and indicates the correct size of round

(Continued on page 94)

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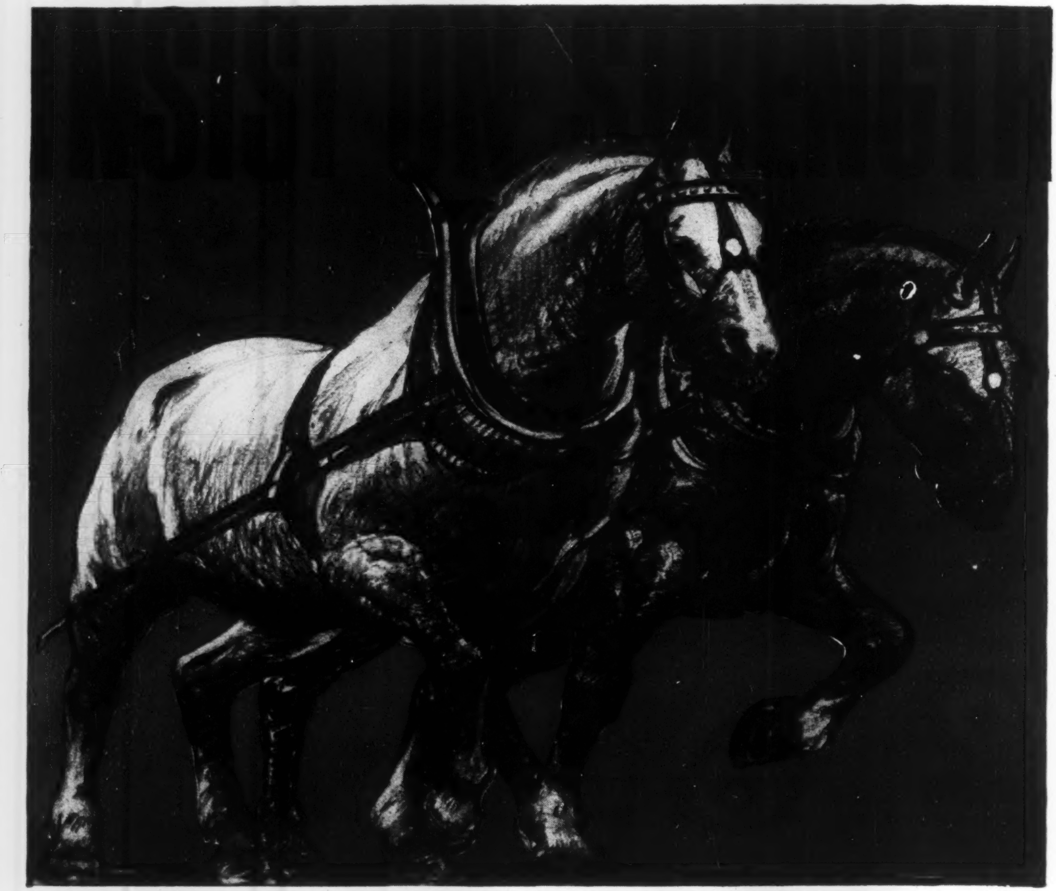

Like a Percheron draft horse cast iron pipe is known for strength

Long life and low maintenance cost of mains laid under city streets depend not only on effective resistance to corrosion but on definite strength factors. The four strength factors that pipe must have to withstand beam stress, external loads, traffic shocks and severe working pressures, are listed on the page opposite. No pipe that is deficient in any of these strength factors should ever be laid in paved streets of cities, towns or villages. Cast iron water and gas mains, laid over a century ago, are serving in the streets of more than 30 cities in the United States and Canada. Such service records prove that cast iron pipe not only resists corrosion but combines all the strength factors of long life with ample margins of safety.

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in pipe for city streets

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The ability of cast iron pipe to withstand external loads imposed by heavy fill and unusual traffic loads is proved by the Ring Compression Test. Standard 6-inch cast iron pipe withstands a crushing weight of more than 14,000 lbs. per foot.

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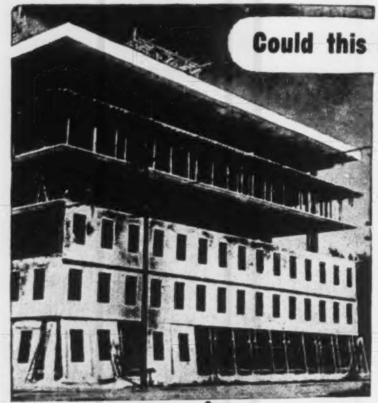

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City of Miami News Bureau photo

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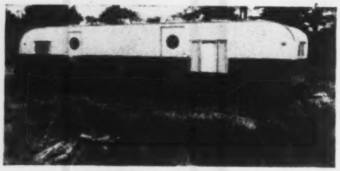

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Athey products—Condensed pocket-size catalog shows all the products or variations made by Athey. It provides immediate reference and eliminates the necessity for referring to files or catalogs. Featured, is a spread of photos showing Athey equipment used during World War II.—ATHEY PRODUCTS CORP., 5631 W. 65TH ST., CHICAGO 38, ILL.

Air-line filters—Bulletin describes, illustrates, and lists applications and specification for pipe-line filters for air and other gases. This 8-pager features a description of the Stavnew double-action principle which provides both mechanical separation and filtration. Installation views are shown for the Series #600 filters (for pressures to 6,000 psi); for vacuum and absorption types; and special models for removal of carbon black and aluminum oxide. —DOLLINGER CORP., 11 CENTRE PARK, ROCHESTER 3, N. Y.

Space heaters—Bulletin 526 describes Counterflo direct-fired space heaters in a range of gas or oil-fired models with outputs from 400,000 to 2,000,000 btu's per hr. Featured is a comparison chart to indicate that steel requirements for these installations has been reduced as much as 50 to 70%.—DRAVO CORP., HEATING DEPT., 5TH & LIBERTY AVE., PITTSBURGH 22, PA.

Portable conveyors—Four conveyors especially designed for construction work are featured in Bulletin 450. They are: The all-aluminum one-man-operated utility conveyor; the lightweight troughed belt conveyor; the heavy-duty troughed belt conveyor; and the power-moved troughed-belt conveyor.—THE FAIRFIELD ENGINEERING CO., MARION, OHIO.

Pullers and jacks—Labor-saving applications of hydraulic pullers and jacks are discussed in this 8-pager. The bulletin features a description of how these units simplify rigging requirements and improve safety in numerous pulling, pushing, and lifting operations. Complete specifications of Re-Mo-Trol units and other Simplex equipment are included.—TEMPLETON, KENLY & CO., 1002 S. CENTRAL AVE., CHICAGO 44, ILL.

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Hatchets in the Tar Heel State

They've been having a tussle in North Carolina over who's to carry the ball for urban roads.

It all began two years ago. Prime mover was the North Carolina League of Municipalities. This group of cities said—and said convincingly—that they were not getting their fair share of state highway user revenues; that the $1,500,000 a year for work on streets in urban centers distributed to cities by the state was not enough.

• The tale that curled—At that time there was no fuss. Everyone agreed, and the ante was raised to $2,500,000 a year. Governor W. Kerr Scott was authorized to appoint a state Municipal Roads Commission to look into the whole matter of increased aid for city streets.

In substance, the commission recommended that the state take over financial responsibility for the construction and maintenance of all city streets much as it took over county roads a number of years ago.

In some quarters this met with favor. State officials could not be blamed for seeing it in a possible increment of power. Local officials of cities and towns might not be blamed if they thought, perhaps, some jurisdiction was being taken away from them.

• They stood to lose—Governor Scott took the position that his administration would favor such an arrangement as the commission described. He made one proviso. There must be increases in taxes to cover the state's additional money burden.

When in 1949 a similar proposal was made for the benefit of the county roads of North Carolina, Gov. Scott took a similar stand. Then he favored a gasoline tax increase to back up the $200,000,000 rural roads bond issue.

With a new proposal of a similar nature, the League of Municipalities and the governor drew together, after a few disagreements over decimals of a cent, along the gas tax front. They supported the commission report. They suggested a $5 hike in automobile license fees. They determined on a half-cent increase in the gas tax. (ENR Feb. 1, p. 26)

With all this pre-arrangement as the legislatures met this year—with the Highway Commission, the governor and the league all smiling and marching in the same direction, sane elements might have expected legal action in line with the overall battle plan.

But the legislature got out of step. The league fled the governor, and there has been a milling around on the field ever since.

• The sudden shock—Rather than up taxes, the legislature enacted a law which provides for state construction and maintenance of all urban roads that are links in the state highway system. In addition to the regular $2,500,000 slice of the highway revenues, cities get $5,000,000 more (ENR March 8, p. 30).

No additional taxes are provided.

While the law was in the works, both the governor and the highway department strained to bring home to the legislature how, under "moneyless" conditions, projects dear to people's representatives might of necessity go by the board.

This raised cries of "pressure politics." Citizens picked sides. The state split on the issue.

At hearings the issue was less whether or not state support should be given cities for their streets, but whether or not this should be done with or without higher taxes, and—of course—in what amount.

• More of the pie, please—Municipalities claimed that they pay one-third of the gasoline taxes and highway license fees in the state. They claimed that of that money they get in return only 4% of total highway revenue. They wanted a fairer share, with or without higher taxes, claiming that there was enough revenue coming in to warrant adopting the provisions of the current law.

The administration pointed with horror to programs already planned, never to come off because of lack of funds. Governor Scott himself encouraged the highway department to be specific. He took full blame or credit for any "pressuring" of this type done by the department.

He accused the league of "running out" on him. He claimed that the use proposed for the state highway revenues was a method of highway user fund "diversion." He testified personally.

But the law passed. It passed in the House March 12. It passed in the Senate March 13. The program will cost the state $11,000,000 annually. It will not relieve the cities of all their road costs, but will contribute heavily to meeting them.

Since the enactment has nothing to fear from gubernatorial ill-weather (in North Carolina the governor has no veto) it remains to be seen whether the League of Municipalities will live up to its claims that it now has no further demands to make upon the state treasury for another six years.

WHO PAYS?—City streets linked to state arteries have been the subject of much discussion concerning financing of their improvement and maintenance.

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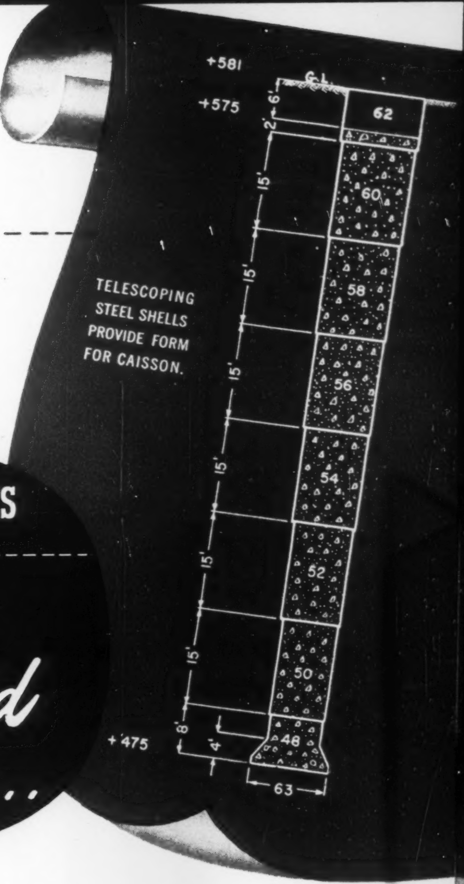

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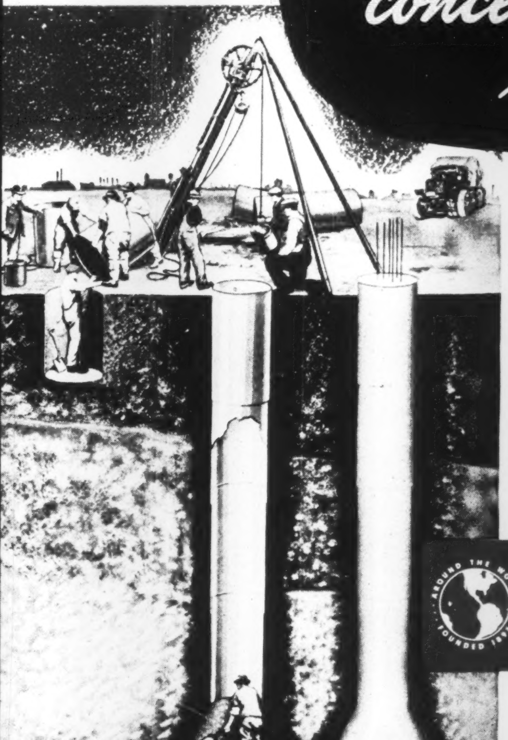
At left, excavating starting pit and placing first cylinder. At center, excavating bell at bottom of the steel-lined shaft. At right, the completed caisson.



Raymond Gow caissons are efficient and economical for supporting heavy concentrated loads under certain soil conditions. The Gow method consists of hand or machine excavation carried on inside of telescoping steel cylinders. Where the caisson rests on hard ground, a bell is usually formed at the bottom to distribute the load over a large area. Where the caisson rests on rock, the bell is usually omitted. After excavation is completed, the steel cylinders are removed as the concrete is poured.

Because heavy equipment is not required and the steel cylinders are re-usable, Gow Caissons are economical in most soils. Your inquiry is cordially invited.

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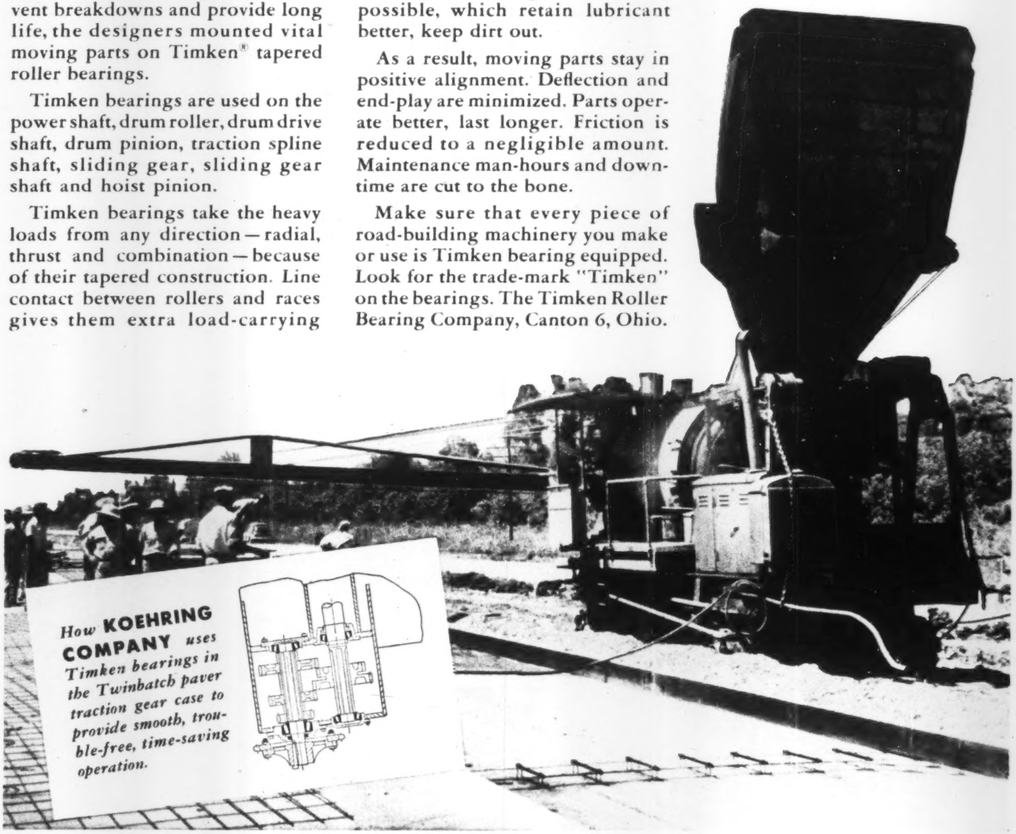

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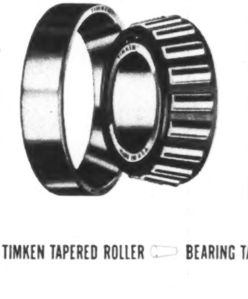

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